

Results of the 2019 wave

# DRIVERS OF PRIMARY SCHOOL DROPOUT IN MOZAMBIQUE

Longitudinal assessment  
of school dropout in 2019



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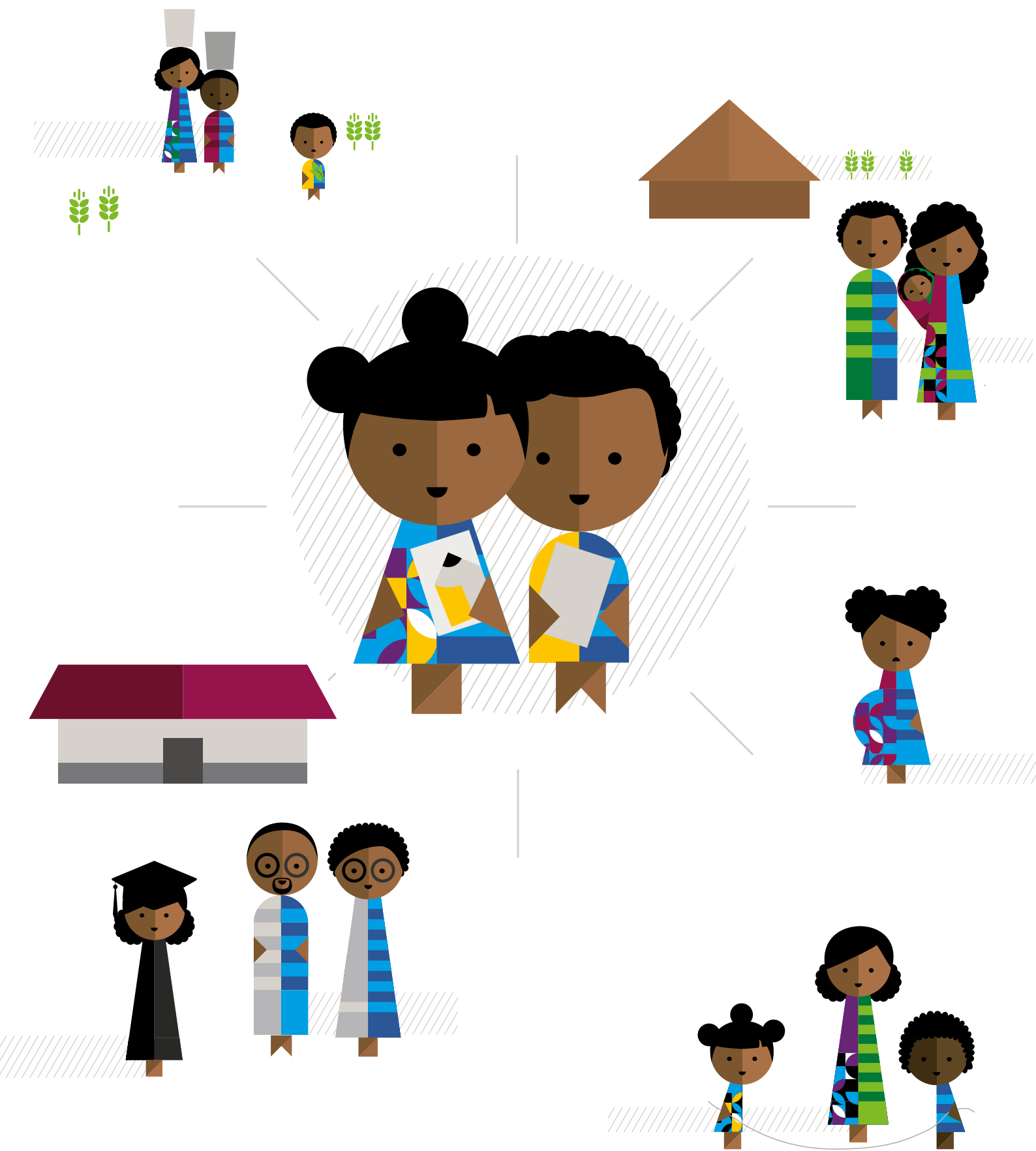
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Results of the 2019 wave of the Avaliação Longitudinal da Desistência Escolar  
(ALDE, Longitudinal assessment of school dropout)

# **Drivers of Primary School Dropout in Mozambique**

Longitudinal assessment of school dropout 2019

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## Abbreviations

<b>ADE</b>	Programa Apoio Directo às Escolas (Direct Support Program for Schools)
<b>ALDE</b>	Avaliação Longitudinal da Desistência Escolar (Longitudinal Assessment of School Dropout)
<b>CSC</b>	Community Score Card
<b>DHS</b>	Demographic and Health Surveys
<b>EGRA</b>	Early Grade Reading Assessment
<b>EMIS</b>	Education Management Information System
<b>ESP</b>	Education Sector Plan
<b>ICC</b>	Intra-Class Correlation
<b>MINEDH</b>	Ministry of Education and Human Development (Mozambique)
<b>PISA</b>	Programme for International Student Assessment
<b>PPS</b>	Probability Proportional to Size
<b>PRONAE</b>	Programa Nacional de Alimentação Escolar (National School Feeding Program)
<b>SitAn</b>	Situational Analysis
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNICEF</b>	United Nations Children's Fund
<b>UP</b>	Universidade Pedagógica de Maputo (Pedagogical University of Maputo)
<b>VAC</b>	Violence Against Children
<b>WASH</b>	Water, Sanitation and Hygiene Services
<b>WFP</b>	World Food Programme

## Foreword

There is a learning crisis unfolding across the world: 53 per cent of children in low- and middle-income countries cannot read and understand a simple text by the end of primary school. In Mozambique, the scale of the crisis calls for immediate action, as only 4.9 per cent of third-grade students were able to read at the expected level in 2016.

Since 2017, the Ministry of Education and Human Development (Mozambique) (MINEDH), UNICEF and the Pedagogical University of Mozambique (UP) have partnered to develop ALDE (Avaliação Longitudinal da Desistência Escolar, or Longitudinal Assessment of School Dropout). ALDE is a longitudinal study of education following the experiences of students, teachers and parents over time to inform national policies to address this learning crisis. ALDE supports ongoing policy dialogue in the context of the Education Sector Plan (ESP) to build an inclusive, equity-based, efficient, effective and innovative education sector.

Since 2018, the ALDE survey has annually collected longitudinal, nationally representative data from around 5,400 primary school students (from grades 1 to 7) in 60 schools across all eleven provinces in the country. This report presents the results of the quantitative data collected in 2019 and identifies the main drivers of primary students' dropout at the individual, household, school and community level.

This report focuses on the determinants of school dropouts in the country. When children leave school prematurely, not only is their learning interrupted, but the trajectories of their future opportunities and lives are forever altered. This report explores the multidimensional process of school dropouts, investigating how individual, household, community and school-level factors interact to lead children in Mozambique to drop out of education. Through this analysis, the report provides important and actionable recommendations to improve education policy in Mozambique towards its journey to achieve learning for every child.

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## Executive summary

The world faces a learning crisis: 53 per cent of children in low- and middle-income countries cannot read and understand a simple text by the end of primary school, and in sub-Saharan Africa alone, this figure is nearly 90 per cent (World Bank and UNESCO Institute of Statistics, 2021). While being at school does not guarantee learning, large numbers of children remain out of school and unable to access learning opportunities. In sub-Saharan Africa, 18.8 per cent (32.2 million) of primary school-age children, 36.7 per cent (28.3 million) of lower secondary school-age children and 57.5 per cent (37 million) of upper secondary school-age children are out of school as of 2018 (UNESCO Institute of Statistics, 2019). Moreover, these numbers are expected to rise in the fallout of the COVID-19 pandemic. An estimated 24 million students across the globe (from pre-primary to tertiary education) are at risk of not returning to school in the aftermath of school closures due to COVID-19 (World Bank, UNESCO and UNICEF, 2021).

In Mozambique, the extent of the learning crisis was concerning even before the school closures in March 2021. Only 4.9 per cent of third-grade students were able to read at the expected level in 2016 (World Bank, 2020b). While around 92 per cent of children attended primary education, only 5 per cent of adolescents attended upper secondary education in the country between 2014 and 2017 (Ministério da Educação e Desenvolvimento Humano, 2020). These statistics underscore the need for additional evidence to understand why children in Mozambique are dropping out of school and not learning when in school. The COVID-19 context brings a heightened sense of urgency: the Government has an opportunity to address further loss of human capital among the current generation of children.

The Avaliação Longitudinal da Desistência Escolar (ALDE), or Longitudinal Assessment of School Dropout, provides unique data and evidence to inform education policy and support the improvement of children's learning in Mozambique. Since 2018, the ALDE survey has annually collected longitudinal, nationally representative data from around 5,400 primary school students (from grades 1 to 7) in 60 schools across the country. This report presents the results of the quantitative data collected in 2019 and identifies the main drivers of primary students' dropout at the individual, household, school and community level. Below are the key findings of the analysis.

**The national dropout rate is high, it varies widely across regions and between urban and rural areas, reinforcing inequalities in the education sector.** While the national dropout rate is 15 per cent, the Northern and Central regions experience dropout rates significantly higher than the Southern region (20 per cent, 14 per cent and 2 per cent, respectively). Dropout rates in rural areas (15 per cent) are more than four times higher than in urban areas (3.4 per cent).

Households experiencing poverty and deprivation and those that had suffered shocks were much more likely to have children who had dropped out of school. Children living in the households in the highest quintile of the wealth distribution have a dropout rate of 3.2 per cent, compared with a rate close to 16 per cent for the children in the poorest half of households. The dropout rate for children engaged in paid work (24.6 per cent) is more than twice the rate for the children not engaged in paid work (11.6 per cent). Additionally, being engaged in unpaid work is associated with an increase in dropout rates from 10.6 per cent to 17.9 per cent. More than one quarter (25.6 per cent) of children had dropped out in households where members had only one meal the day before the survey, compared with only 10 per cent for those who had received three meals. In households without access to water and sanitation services, children were almost five times more likely to drop out than children who had access to these essential services. Finally, children living in urban households exposed to shocks had a dropout rate three times higher than the children living in urban households not exposed to shocks.

**The school context influences dropout rates among students by gender.** Students in classes with female teachers, in schools with female directors and an active school council, were less likely to drop out. Students in classes with a female teacher have lower dropout rates (10.2 per cent for boys and 11.3 per cent for girls) than students with a male teacher (18.2 per cent for boys and 17.8 per cent for girls). Similar effects are also seen with school leadership. Students attending schools led by a female director drop out far less than students in schools led by male directors (8.2 per cent and 14.2 per cent respectively). Dropout rates nearly double from 7.5 per cent to 14.1 per cent when the director has high rates of absenteeism. Moreover, schools that were open for 95 per cent of school days had dropout rates of just 4.7 per cent, compared with 14.8 per cent when schools were closed for 15 per cent or more of regular school days. Children in schools

with active school councils that met four or more times during the year had lower dropout rates (8.8 per cent) than children in schools where the council met three times or fewer during the year (10.6 per cent).

**Children in schools with better infrastructure, including water, sanitation and hygiene (WASH) facilities, and who feel safe in school experience lower dropout rates.** For instance, both access to drinking water and students' exclusive toilets are associated with reductions in the dropout rates (from 13 per cent to 6.3 per cent and from 16.8 per cent to 8.4 per cent, respectively). Regarding safety at school, children who report not feeling safe have a dropout rate more than twice the rate of children who feel safe (28.8 per cent and 13.1 per cent).

**Community-level access to infrastructure and gender-specific norms and traditions can influence dropout decisions.** Dropout rates of students living in communities with lower levels of access to infrastructure and services (14.9 per cent and 12.6 per cent respectively) are larger than the rates for children living in communities with high levels of access (3.6 per cent and 8.2 per cent respectively). Distance to school is also a relevant factor. The dropout rate is 17.4 per cent when children spend more than 30 minutes travelling to school, and falls to 13 per cent when they live within 30 minutes to school. Cultural traditions and customs of the communities may also influence the likelihood of remaining in school. For girls, participation in initiation rites is associated with an increase in dropout from 12.8 per cent to 31.5 per cent.

**Dropout is associated with lower learning levels, as shown by the scores on the Early Grade Reading Assessment (EGRA).** A subsample of children surveyed in 2019 took the EGRA. While results are low for both children that remained in school and for those that dropped out, dropout children have even lower literacy skills levels than children who remained in school. While children who remained in school could correctly identify 13 letters (out of 100) and 3.8 words (out of 50), children who dropped out could only identify 6.3 letters and 1.1 words. Additionally, dropout children had not developed reading comprehension skills as they lacked the very foundational literacy skills. When asked questions about two different short texts (four questions for listening comprehension and five questions for reading comprehension), dropout children could only correctly answer 0.9 questions on the first text and virtually zero on the second text, while children who remained in school correctly answered 1.1 and 0.21 questions respectively about the two texts.

These findings show that dropout is a multidimensional process, in line with the socio-ecological model used as a theoretical foundation of ALDE. They indicate the different characteristics of the child, the household, the school and the community that interact in driving dropout decisions. In particular, the findings draw attention to the manner in which structural inequalities, in terms of regional differences and the rural/urban gap, amplify the well-known effects of poverty and deprivation at home, leadership and lack of resources at school- and community-related level, and norms and traditions.

The findings also indicate that dropout is not a random process. It is a cumulative process evolving over time and, as such, it is possible to identify the children facing a higher probability of abandoning school. This gives the opportunity for education authorities to implement programmes that reduce dropouts. However, this also emphasizes the need to have better monitoring and information systems and more engaged and participative school directors, teachers, caregivers and communities. It is through understanding dropout as a non-random cumulative process that ALDE 2019 brings three innovations to the education policy conversation in the country. First, it offers a unique longitudinal dataset for evidence-based policy dialogue. Second, it explores how learning differentials, especially in terms of literacy skills, can be a warning indicator of children struggling at school. Third, ALDE 2019 makes a comprehensive analysis of household, school and community-level factors that affect dropout, highlighting the need for inter-sectoral collaboration to improve educational outcomes.

Based on the findings presented here, two groups of policy recommendations are proposed. First, the policy recommendations that can be implemented in the short term due to existing programmes or policy tools in the country are as follows:

1. **Harmonize a transparent, accountable and effective early warning system** to monitor students', teachers' and directors' attendance, as well as school closures, building on the upcoming Community Scoring Card programme. This warning system can be as fully integrated with the Education Management Information System (EMIS), and should be used to design remedial support that can help prevent absenteeism and dropout.

2. **Enhance and strengthen the capabilities of school councils to mobilize and engage communities.** Implement the current programme of school council revitalization to achieve more active and better trained school councils that can support school management. More active school councils can lead the maintenance and construction of better WASH facilities at school, improve communication between caregivers and schools about participation in initiation rites, advocate for the safety of schools and the students, and guarantee the continuity of programmes such as the Girls' Clubs and the interest-specific students' clubs (Círculos de Interesse, in Portuguese).
3. **Train and hire more female school directors.** Having a female school director is associated with lower dropout rates. Therefore, it is recommendable to hire more female school directors, especially in those schools with high dropout rates.

Second, the policy recommendations that can be implemented in the medium term are as follows:

1. **Improve the quality of district supervision and use its findings for better school management.** Supervision visits, acting as a school performance evaluation, and encouraging co-operation between school directors, education authorities, communities and parents, can help schools to improve their school development plan, aiming to strengthen school management. Simple school report cards can be developed from administrative data to quickly provide information to district officials and schools of the status and needs of their schools vs. others in the country ([Jarousse et al., 2019](#)).
2. **Develop a cost-effective and equity-based school-grant allocation formula.** Using the funds and resources in the school grant (Programa Apoio Directo às Escolas - ADE, in Portuguese), this allocation formula will support schools based on need, factoring in regional differences, the urban/rural divide across the country and the threats posed by climate change and natural disasters. It can also seek to create incentives to encourage more female teachers and directors, to work in more deprived areas and to reduce student-teacher ratios. This could follow approaches carried out by UNICEF and Ministry of Education partners in other countries using administrative data to develop an equity index for the allocation of resources ([Jarousse et al., 2019](#)).
3. **Train and hire more teachers, especially female teachers in the schools with high student-teacher ratio.** In addition to hiring more teachers to reduce the student-teacher ratio, it is recommended to hire more female teachers to increase their proportion within the total number of teachers. Taking into account the results of the study which suggest that student dropout rates are lower with female teachers.
4. **Invest more in activities related to school WASH, including soft component.** This is another very reasonable investment to reduce the dropout rate so that efficiency in primary education can be improved.
5. **Provide material support for vulnerable children to remain in school.** Under well-defined criteria, authorities can find ways to provide school kits (with school-related items, such as notebooks, pens and textbooks) and access to the school meal programme to children suffering from deprivation, children who have to work, pregnant girls (and those already with children of their own) and children who live in households affected by natural disasters or other types of shock.
6. **Invest more to improve students' learning skills from the early grades onwards.** Enhancing the coverage, materials, methodologies and teachers' training and co-operation within the Pedagogical Zone, the expansion of the national reading programme can support students to develop the necessary literacy skills and increase their access to bilingual education. Focus on the early years should include pre-primary education, given the strong association between early childhood education and outcomes throughout primary school and beyond.
7. **Promote cross-sector collaboration to reduce dropout and absenteeism at school.** The Violence Against Children (VAC) reporting mechanism was approved by the government of Mozambique in 2020, with an operational plan developed across relevant Ministries, including the Ministries of Interior, Gender, Social Action and Justice. Strengthening efforts and collaboration across ministries to tackle the root causes of absenteeism is critical. MINEDH has worked collaboratively with the Ministry of Public works to improve WASH facilities in the aftermath of devastating cyclones from 2019. These two ministries can continue to strengthen this collaboration, especially for children with disabilities.



## Areas for future investigation

As ALDE continues beyond 2019, findings from this report open up new avenues for potential research and analysis in the future, from the development of implementation research to uncover successful locally led innovations at school level, to unpacking the mechanisms behind the strong association between female directors and better education outcomes. Finally, additional research and benefit incidence analysis could investigate the equity implications of spending on education, aligned with the goals for better equity in the delivery of education in Mozambique.



# 1. Introduction

The world faces a severe learning crisis: 53 per cent of children in low- and middle-income countries cannot read and understand a simple text by the end of primary school (World Bank and UNESCO Institute of Statistics, 2021). In sub-Saharan Africa, the crisis is even more severe, with 87 per cent of students not mastering basic literacy. While progress has been made to provide primary schooling around the world, large numbers of children remain out of school. Worldwide, 263 million children, adolescents and youth are out of school. In sub-Saharan Africa, 18.8 per cent (32.2 million) of children of primary school age, 36.7 per cent (28.3 million) of adolescents of lower secondary school age and 57.5 per cent (37 million) of adolescents of upper secondary school age are out of school as of 2018 (UNESCO Institute of Statistics, 2019). Moreover, these numbers are expected to rise in the fallout of the COVID-19 pandemic. Around 24 million students across the globe (from pre-primary to tertiary education) are at risk of not returning to school in the aftermath of COVID-19 (World Bank, UNESCO and UNICEF, 2021).

In Mozambique, the extent of the learning crisis is alarming: 4.9 per cent of children in the country were reading at the expected level by age 10 as of 2016 (World Bank, 2020b). While 91.5 per cent of children were enrolled in primary education, only 5 per cent of adolescents attended upper secondary education between 2014 and 2017 (Ministério da Educação e Desenvolvimento Humano, 2020).

In the context of these challenges, MINEDH and UNICEF Mozambique established the Avaliação Longitudinal da Desistência Escolar, or Longitudinal Assessment of School Dropout (ALDE), to provide data and evidence on school retention and children's learning that can inform education policy. As a longitudinal study, ALDE tracks children through primary education, identifying the critical points when the risks of absenteeism and dropout are the highest. ALDE uses a mixed-method design with quantitative and qualitative data that helps explain the patterns and drivers of students' educational outcomes (such as dropout, school attainment and grade progression) over time. The unique nature of this longitudinal study is the main contribution of ALDE to the educational policy dialogue in the developing world.

This report presents the main results of the data collected in 2019, with a particular focus on the factors associated with student dropout. The longitudinal design of the study, with data collected in 2018 and 2019, allows for the identification of children who dropped out of school and the individual, household, school and community-level factors that may account for these dropouts. Data from ALDE 2019 provides unique baseline information for understanding the COVID-19 learning crisis as it measures pre-pandemic dropout rates. Understanding the dynamics of dropout has never been more urgent as education systems all over the world struggle to reopen after the COVID-19-related school closures and it is expected that dropout rates will increase worldwide (Azevedo et al., 2020).

This report is organized as follows: Section 2 introduces the main methodological elements of ALDE 2019. Section 3 presents an overview of school dropout in the country. Section 4 analyzes the relationship between dropout and the household's socio-economic factors. Section 5 then examines the association between school-level characteristics and dropout rates. Section 6 presents the association between community-level variables and dropout rates. The relationship between dropout and learning, with a subsample of students who took the Early Grade Reading Assessment (EGRA), is analyzed in Section 7. Finally, conclusions and policy recommendations are presented in Section 8.

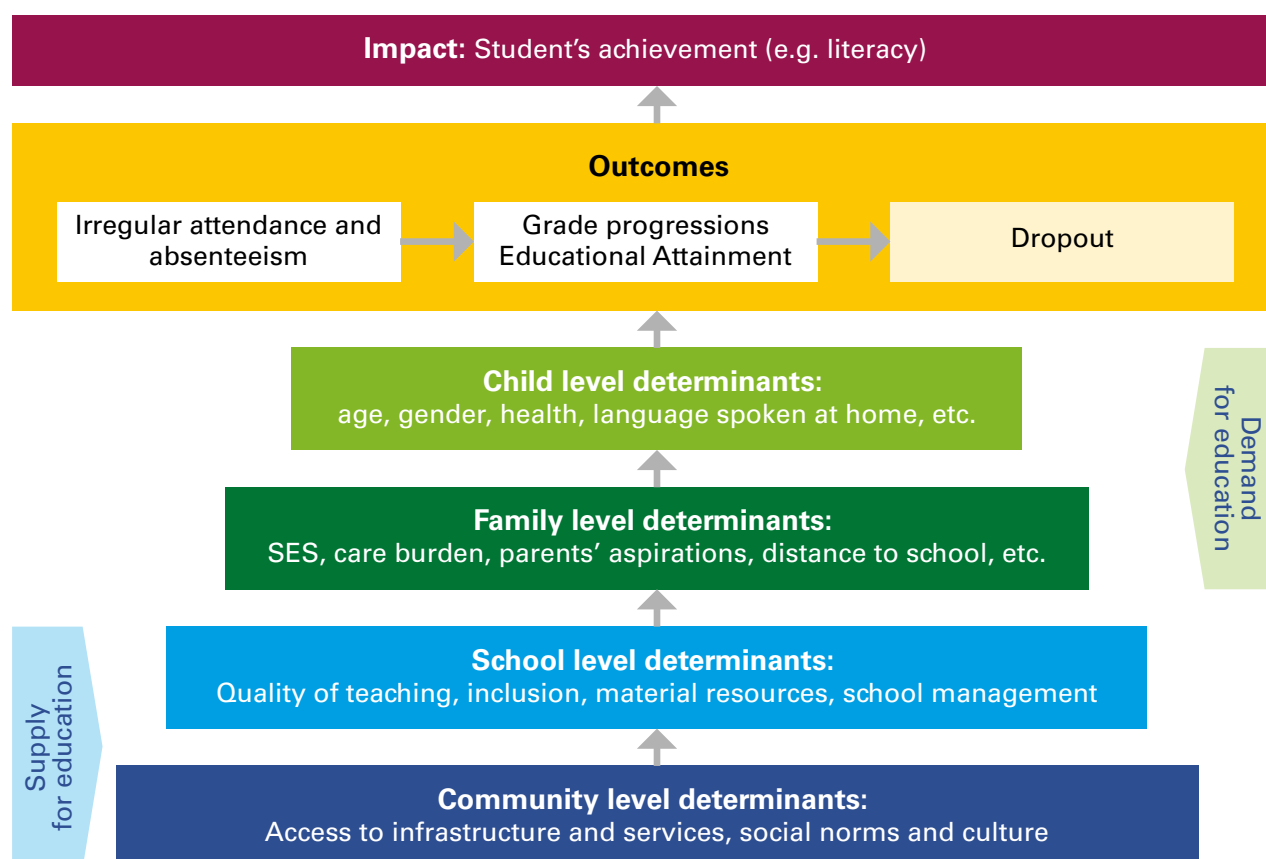
## 2. Methodology

ALDE is aimed at developing empirically supported theories of educational effectiveness by identifying the determinants of dropout and informing educational policy and practice (Creemers and Kyriakides, 2007). This section presents the conceptual framework, study design, sampling methodology and the calculation of the key outcome variable. Further details on the methodology can be found in Annex 1.

### 2.1. Conceptual framework

ALDE's conceptual framework is based on Bronfenbrenner's (1979) socio-ecological model (see Figure 1). The analysis following this framework is centered on the individual child, his/her characteristics and related outcomes nested in four hierarchical levels of influence: i) individual (child outcomes); ii) family resources and interpersonal relationships; iii) community and neighbourhood resources; and iv) the enabling environment. As an analytical tool extending beyond the sectoral boundaries of primary education, ALDE searches for the interlinked influence of family, community, schools and institutions on public policies to achieve better educational outcomes.

Figure 1: Components of the four domains and hypotheses



Source: Bronfenbrenner, 1979.

After an initial pilot in the province of Zambezia in 2017, ALDE was first implemented in 2018, when students' absenteeism and educational attainment (grade progression) were the main outcome variables under study. In 2019, the second wave of this study, understanding the determinants of student dropouts is the key area of investigation. The socio-ecological model informs how student dropouts relate to various child-level characteristics (e.g., gender and age), family-level conditions (e.g., wealth, deprivation, parental expectations), school-level characteristics and practices (e.g., teachers' and directors' characteristics, supervision visits and school councils) as well as community-level variables (e.g., access to infrastructure and services). Factors facilitating or reducing students' school engagement and outcomes, such as dropout, can be found at each level of the interconnected dimensions. The detailed list of components of each domain was identified with key stakeholders during methodological workshops and using a literature review as a basis (at the planning stages).

## 2.2. Study design

ALDE is a longitudinal, nationally representative survey targeting children in primary school grades 1 to 7. Following the explanatory sequential approach (Creswell et. al. 2003), ALDE is a mixed-method study with quantitative data collected through surveys complemented by qualitative data collected through focus groups and in-depth interviews. The study covers all provinces of Mozambique, both rural and urban areas, capturing geographic, cultural and socio-economic differences within the country

## 2.3. Sampling strategy

A two-stage cluster sampling approach was employed for the base year sample in 2018. Probability proportional to size (PPS) sampling was used to ensure that each enrolled student in primary school had the same probability of being selected. This means that students have a known and non-zero probability of selection into the sample. Any potential for bias in sample estimates due to variations from the equal probability of selection method was addressed using sampling weights. The procedure resulted in a sample size of 5,400 students and 60 schools, out of 9,325 schools, across all provinces in Mozambique.<sup>1</sup>

Schools were the first stage of selection and students within schools were the second-stage units. In each school, cohorts of 90 students were randomly selected from three different grades (grade 1 to 7). In each school, grade 1 pupils were selected to ensure that a cohort of 30 pupils is followed from the first grade to the final grade of primary education. The other two grades (from grade 2 to 7) were randomly selected proportional to size.<sup>2</sup>

Table 1 shows that 5,037 students remained in the sample from 2018 to 2019 with an attrition rate of 6.1 per cent. Several factors contributed to attrition, such as temporary or permanent family migration (due to work, lack of economic resources or marriage) or transferring to a school far away from where they were initially surveyed (more than one hour's drive by car). The number of schools, school directors and teachers in the 2019 sample increased as students were followed to new schools that were less than one hour's drive from the original school in 2018. Therefore, in 2019, 63 new school directors and 188 new teachers were interviewed.

Overall, given that the sample was based on students' primary school grade rather than age, the survey achieved a wide age distribution of children, including 941 adolescents aged 13–18 and five young adults aged 19–25 years. Although the overall sample was relatively gender balanced, the share of girls for the oldest age group fell to 22 per cent. The reduced gender balance as children age indicates that a lower percentage of girls still attend primary school after entering adolescence.

<sup>1</sup> The procedure involved using an intra-class correlation (ICC) of 0.35 for the computations.

<sup>2</sup> This would have a sampling accuracy equivalent to a simple random sample of 170 students (with a 7.5 per cent sampling error and a 95 per cent confidence interval). The design effect is around 32.1. The value of the design effect (Kish, 1965) for a two-stage cluster sample design depends, for a given cluster size, on the value of the coefficient of ICC. Usually, the size of the simple random sample is around 400 students in order to obtain 95 per cent confidence limits of  $p \pm 5$  per cent. The 'effective sample size' (Kish, 1965) for a given two-stage cluster sample is equal to the size of the simple random sample, which has a level of sampling accuracy, as measured by the variance of the sample mean, that is equal to the sampling accuracy of the given two-stage cluster.

Table 1: Achieved sample sizes

Subject interviewed	Planned	2018		2019	
		Achieved	Female (%)	Achieved	Female (%)
School director	60	60	20.6%	123	11.9%
Class teacher	> 180	480	44.4%	668	44.5%
Student	5,400	5,364	46.5%	5,037	46.3%
Caregiver	5,400	5,145	46.4%	5,037	46.4%
Community leader*	> 60	72	5.0%		

\*Community leaders were not interviewed in 2019. Their answers from 2018 were used as the basis for the community-level variables in 2019.

## 2.4. Measuring dropout

ALDE defines dropout as 'withdrawals from compulsory education before its completion' (ALDE, 2018). It is important not to confuse dropout with out-of-school children, since the latter have not been exposed to school during the year analyzed (UNESCO, 2005 and 2021a). For the second wave of ALDE, enumerators conducted several checks to confirm whether children remained enrolled or dropped out of school.<sup>3</sup> It is the variation in the enrolment status between 2018 and 2019 that defines whether the child remained in school or dropped out. The checks reduced the possible bias created by the missing information from the households that could not be interviewed, the possible inconsistencies from the administrative records (enrolment books) and the recall errors of teachers or school directors. This process took place towards the end of the school year (from September onwards) to guarantee that children were already in school and to avoid the possible delays due to enrolment procedures. If a child was confirmed as not enrolled in school after conducting all checks, the child was classified as a dropout.

## 2.5. Limitations

Despite the advantages of collecting information on children at different points in time, ALDE, as a longitudinal study using cluster sampling, also has some limitations. In terms of its longitudinal nature, sample attrition, panel conditioning and limited representativeness are the main issues to consider. Sample attrition leads to sample-size reduction and to non-response bias when attrition is not at random. Panel conditioning results in influencing participants to change their answers due to being members of a longitudinal study. Finally, limited representativeness entails that the cohort being tracked may not be entirely representative of the population as time passes by. Attrition is addressed by an exhaustive process of searching for and tracking the selected children. However, it has to be recognized that attrition could be higher than expected in the provinces where families migrated due to the devastating effects of cyclones Idai and Kenneth. Panel conditioning is dealt with by designing a survey questionnaire and interview process that elicit truthful and verifiable answers. The selection of children from different primary education grades

<sup>3</sup> First, the school's enrolment books were revised at schools, in consultation with school directors and class teachers. If the name of the target child was not found in the enrolment books, caregivers were consulted to confirm whether the children was enrolled at a different school. If the caregiver reported that the child had transferred to another school, the enrolment book of the new school was revised (when the distance to that new school was within one hour's drive for the enumerators to visit).



(besides the children of grade 1) allows for a sample that can dynamically represent the entire student population in the country.

Cluster bias, larger sampling errors and size equality are the limitations associated with cluster sampling technique employed for the selection of the children. The definition of the cluster may lead to introducing a bias since such definition may not be based on the distribution of the population. This bias may result in larger sampling errors that reduce the accuracy of the estimates. As for the size equality, cluster sampling requires that clusters have the same sample size, which may lead to an overrepresentation of the smaller clusters. These limitations were tackled by relying on the MINEDH administrative classification of the school size as the basis for the identification of the clusters. In this manner, the probability of overlapping data points and the possible bias caused by a more subjective classification are reduced. Finally, sampling within the cluster was further adjusted by the intra-class correlation (ICC) coefficient to reduce the risks of overrepresentation.



### 3. An overview of dropout rates in Mozambique

#### Key findings

- **Dropout rates vary across the country.** While the national dropout rate was 14.7 per cent, dropout rates in the Northern (19.8 per cent) and Central (14 per cent) regions are significantly larger than the dropout rate in the Southern region (2 per cent).
- **The risk of dropout increases as children age, especially for girls.** The dropout rate for boys remains constant at around 10 per cent until they are 10 years old. Among early adolescents, the rate begins to increase to 11.5 per cent (11–12 years old) and reaches 22.1 per cent when they are 13 years or older. For girls, the dropout rate increase with age is more constant, increasing from 8.7 per cent when they are 7 years old, to 13.1 per cent when they are 11–12 years old and peaking at 23.9 per cent when they are 13 years and older.
- **The dropout rate in rural areas is 4.4 times higher than in urban areas.** While the dropout rate in urban areas is 3.4 per cent, it reaches 15 per cent in the rural areas

#### 3.1. Dropout rates across the country

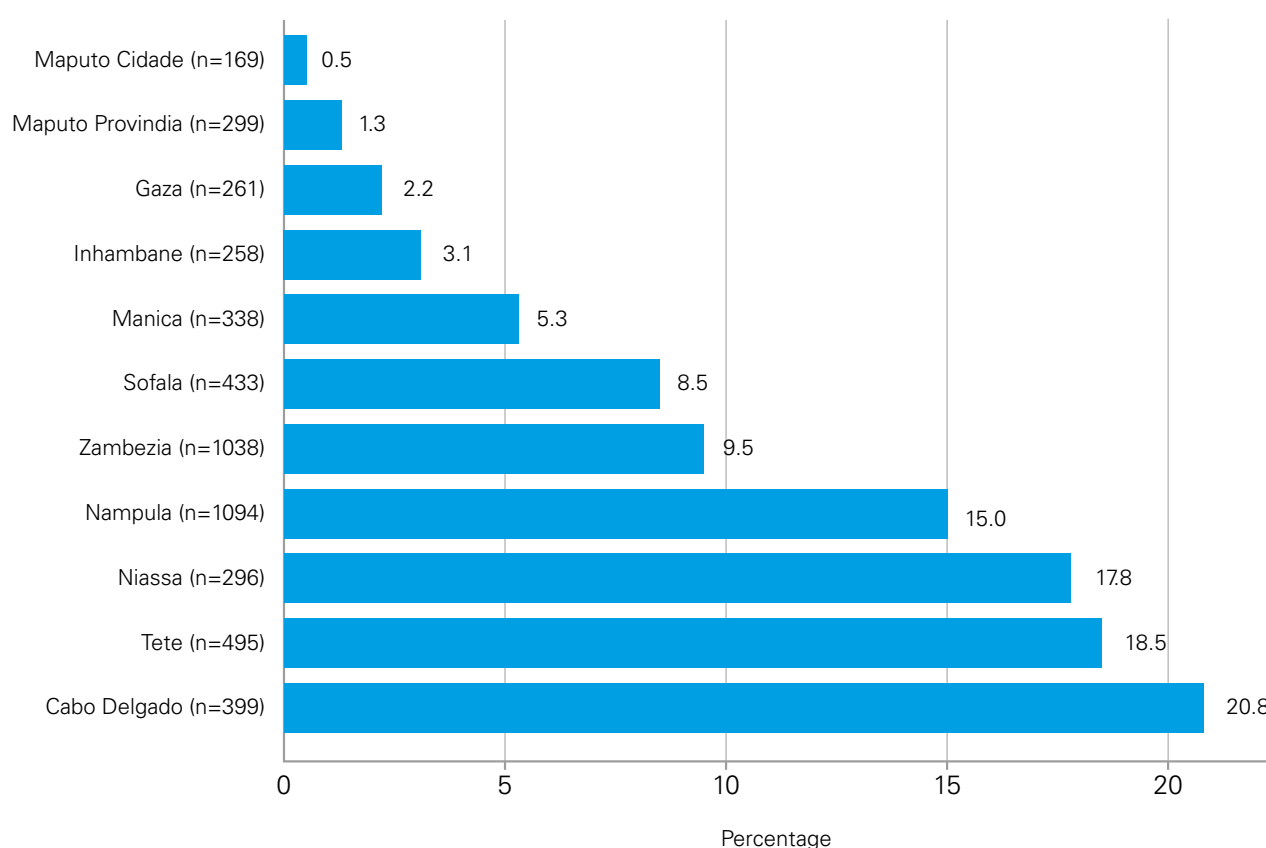
In 2019, 14.7 per cent of children dropped out of primary education across Mozambique. This figure is higher than the 11.2 per cent reported in the 2015 Situational Analysis (SitAn) (Park, 2017) and the dropout rates reported for lower primary (8.9 per cent) and upper primary (7.4 per cent) education in the Education Sector Plan 2020–2029 (Ministério da Educação e Desenvolvimento Humano, 2020). Differences are mainly explained due to methodology, as MINEDH uses administrative data, while SitAn and ALDE employ sample data.

Dropout varies greatly across regions (see Figure 2). In Cabo Delgado province, the dropout rate is 20.8 per cent, around 41 times more than the rate in the city of Maputo, where almost no dropouts were recorded (0.5 per cent). This variation echoes differences in welfare levels across the country (World Bank, 2018) as only some regions benefit from the exploitation of the vast natural resources in Mozambique (Gradin and Tarp, 2019).

Caregivers of the children who dropped out were asked about the main reasons for children doing so (see Table A2, Annex 2).<sup>4</sup> According to their caregivers, 42.2 per cent of children who dropped out left school because they no longer wanted to go to school: this reason seems to be equally important, regardless of the age of the children. More qualitative information is needed to disentangle how this is related to economic pressure, a lack of motivation or a lack of perceived value of schooling. Caregivers also reported that children left school because of migration (11.1 per cent) and travel (9.3 per cent). Relocation decisions in Mozambique have been historically driven by the labour opportunities in the neighbouring countries and regional disparities (De Vletter, 2007). Finally, caregivers reported that 7.9 per cent of their children abandoned school because they got married. Girls represented 90.7 per cent of the children who dropped out of school due to marriage. This is despite the introduction in 2019 of a law prohibiting child marriage before the age of 18 years, without exception (Odhiambo, 2019).

<sup>4</sup> It was an open-ended question to capture as much variability and to elicit a more truthful answer.

Figure 2: Dropout rates, by province 2019



Source: ALDE, 2019.

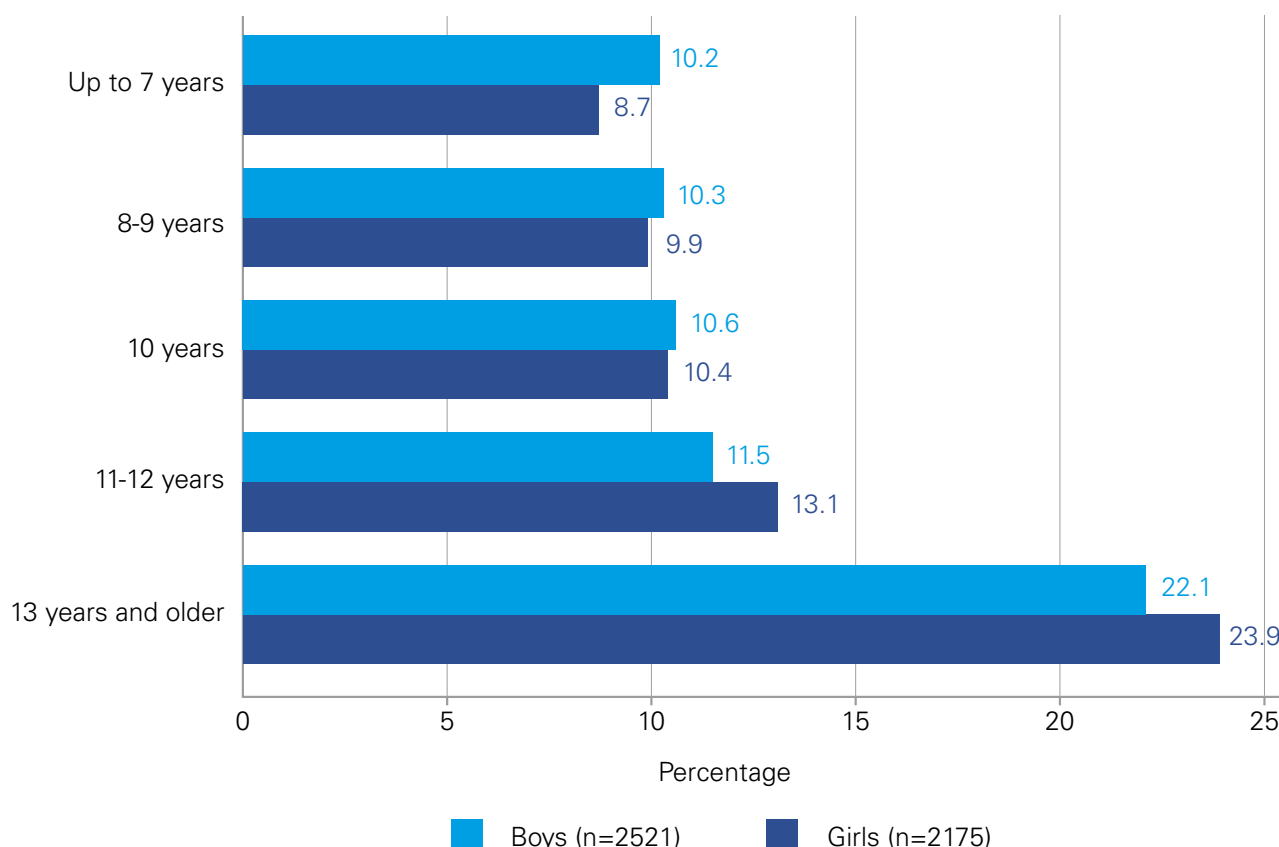
### 3.2. Dropout rates across gender, age and urbanicity

Overall, boys and girls have the same dropout rate (14.7 per cent), but the causes of dropout differ between genders. For instance, girls may be more likely to experience risk of dropout as a result of gender norms surrounding parental investments, extra-curricular activities, household responsibilities and schooling costs (Shahidul and Karim, 2015).

As students get older, the risk of dropout increases (see Figure 3). Overall, the dropout rate of boys is relatively stable up to 10 years of age and then increases. The dropout rate for boys is actually higher than for the girls at younger ages, but this trend reverses at around 10–11 years of age. For girls, however, there is a more constant increase in dropout rates. Across both genders, children 13 years and older experience a dropout rate almost twice the rate of their immediate younger counterparts. Along with this increase, it can be seen that the increase in dropout rates is slightly larger for girls.<sup>5</sup> This age pattern could be explained by the increasing opportunity cost of education as children age. For instance, while only 8.9 per cent of children up to 7 years are involved in housework, this rate rises to 26.8 per cent for the boys and 28.3 per cent for girls aged 13 years and older.

<sup>5</sup> No significant gender differences were found for each age group after conducting t-tests.

Figure 3: Dropout rates, by gender and age group



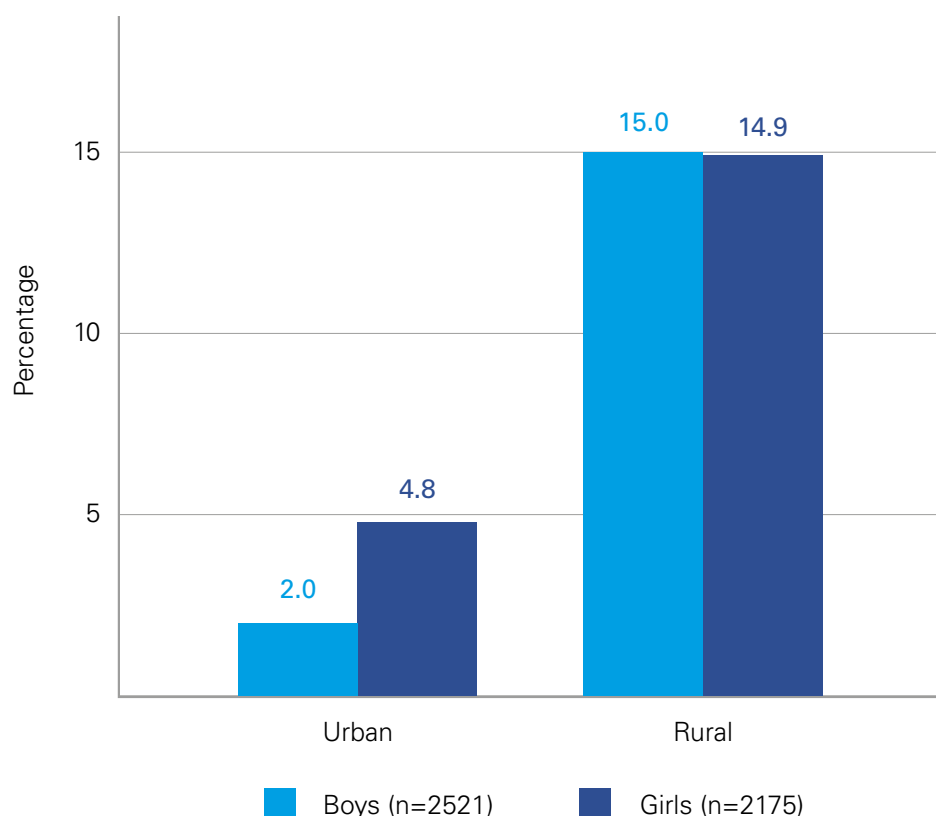
Source: ALDE, 2019.

As for location, while dropout in urban areas is 3.4 per cent, it reaches 15 per cent in rural areas (see Figure 4). This large difference can be explained by multiple factors. One is sample composition: 87.8 per cent of children in the sample live in rural areas, while the share of the rural population in the country was 63.5 per cent in 2019 (World Bank, 2021a). Additionally, there are large differences in class, socio-economic status and ethnicity between urban and rural areas (Jordan et al., 2012). For instance, 46 per cent of the children in rural areas are engaged in unpaid work, compared with only 3.2 per cent of children in urban areas.

While no gender difference is observed among the boys and girls living in rural areas, the dropout rate for girls is more than double the rate of boys in urban areas.<sup>6</sup> Age differences between urban and rural girls may amplify the effect of the location and increase the pressures to abandon school. While 20.4 per cent of female students in the rural areas are in the 13 years and older age group, the percentage for the urban girls is 27.7 per cent.

<sup>6</sup> The difference in urban areas is significant at a 10 per cent level (t-statistic equal to 1.77 and p-value of 0.077).

Figure 4: Dropout rates, by location and gender



Source: ALDE, 2019.

### 3.3. Dropout as the ultimate outcome

Dropout is the last stage in a dynamic, cumulative and multidimensional process of school disengagement (Fernández-Suárez et al., 2016). School attendance, grade repetition and educational attainment are intermediate outcomes that, directly and indirectly, contribute to the dropout process.

ALDE uses an observational attendance control (by registering the attendance of the selected children on the days of unannounced school visits of the enumerators,<sup>7</sup> and teacher and caregiver reporting on a measure of chronic or frequent absenteeism, defined as missing a determined percentage of school days (see Box 1).<sup>8</sup> Improving attendance is an effective policy to prevent dropout. For instance, a study showed that interventions targeting children experiencing chronic absenteeism improve the probability of those children remaining in school by 52 per cent (Balfanz and Byrnes, 2013).

<sup>7</sup> During the five weeks that enumerators were in the field, the research co-ordinator randomly chose two days a week for enumerators to go to schools and check that sampled students were attending. From this observational information, the observed average attendance mean was calculated.

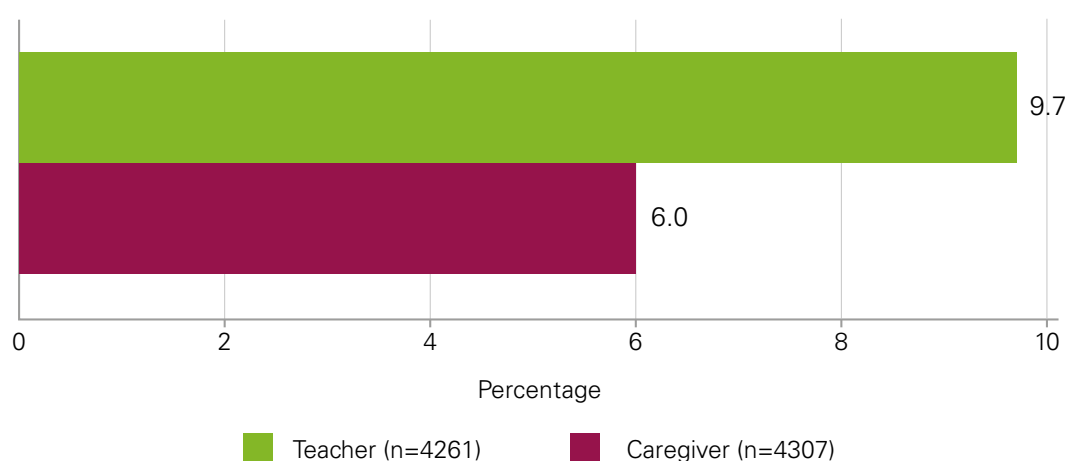
<sup>8</sup> For instance, the American Federation of Teachers defines chronic absenteeism as 'missing at least 10 percent of days in a school year for any reason, including excused and unexcused absences' (see [Chronic absenteeism](#)).



## Box 1: Absenteeism in ALDE 2019

Primary school attendance is positively associated with cognitive development and literacy skills, especially for children in households with a lower socio-economic status (Ready, 2010). In 2018, teachers reported that 9.2 per cent of the children were infrequently or never attending school, a figure that was close to the 8.7 per cent reported by the caregivers during the same year. In 2019, the figure reported by the teachers remained relatively stable at 9.7 per cent. However, there is a significant reduction in the percentage reported by the caregivers, as the figure went down to 6 per cent. This contrasts with what was found using the unannounced visits of the enumerators: children's absenteeism was observed at 39 per cent in 2018 and increased to 50.7 per cent in 2019. Furthermore, the unannounced visits revealed that absenteeism increases as children age, ranging from around 25 per cent for children in the youngest age group to close to 45 per cent for those in the oldest age group. Moreover, using this last measure of students' attendance in a hierarchical logistic model, it was found that students recorded as present in 80 per cent or more of the preceding year's attendance checks has a 7 per cent reduction in their probability of dropout (see Annex 1).

**Box Figure 1: Infrequent attendance of students, as reported by teachers and caregivers**



Source: ALDE, 2019.

These figures have to be read with care and their differences recognized. For instance, caregivers may be reporting less chronic absenteeism due to social desirability bias and even recall error. When considering the unannounced visits, it is also possible that children did not go at all during that day, arrived late or left early (referred to as truancy) (see Warne et al., 2020 for a discussion).

Repetition (see Box 2) and educational attainment (see Box 3) are closely intertwined.<sup>9</sup> Grade repetition signals a higher probability of dropout, education sector inefficiencies, low quality of education and differential psychological impacts on students and their families (Kabay, 2016). As a child repeats and lags behind age-related expectations, the child experiences a decline in academic confidence, interest and learning motivation, which translates into an increased likelihood of dropout (Kretschmann et al., 2019).<sup>10</sup>

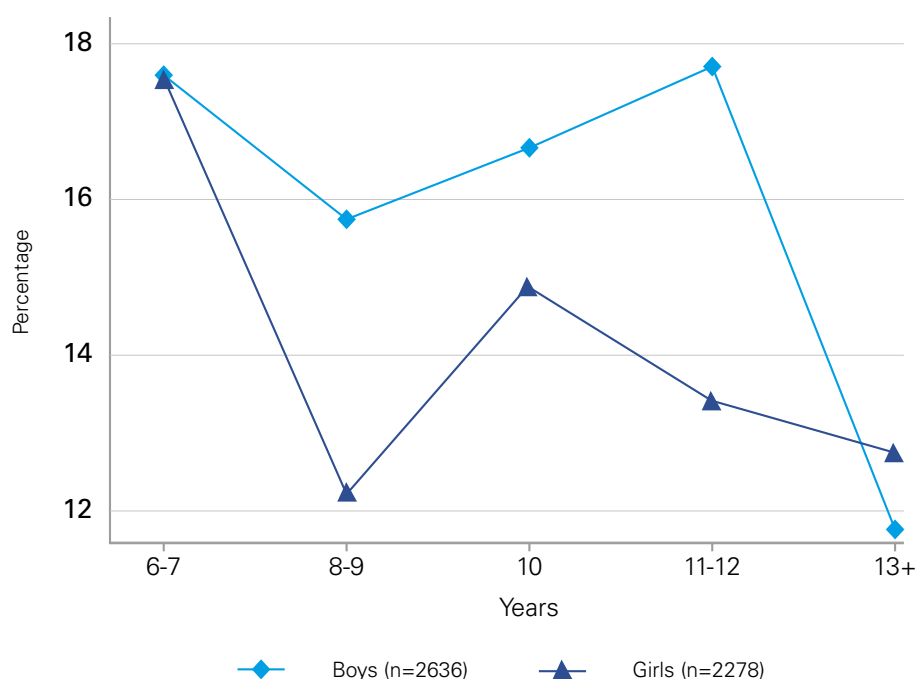
<sup>9</sup> See the report for ALDE 2018 for a more thorough discussion on absenteeism, repetition and school attainment.

<sup>10</sup> Late school entry, which implies that children are below the expected grade for their age, is common in developing and poor societies and is associated to high dropout rates (Nonoyama-Tarumi and Loaiza, 2010).

## Box 2: Grade repetition in ALDE 2019

In 2018, 14 per cent of children were reported as repeating the grade. Although not comparable with the figure of 2018, grade repetition in 2019 was 14.5 per cent<sup>11</sup>. The highest repetition rates are for grades 1 and 5, at 16.8 per cent and 18.1 per cent respectively. The high rates in grade 1 deserve particular attention as there is a strong association between early achievement and later educational outcomes (Glick and Sahn, 2010).

Box Figure 2: Repetition, by age group



Source: ALDE, 2019.

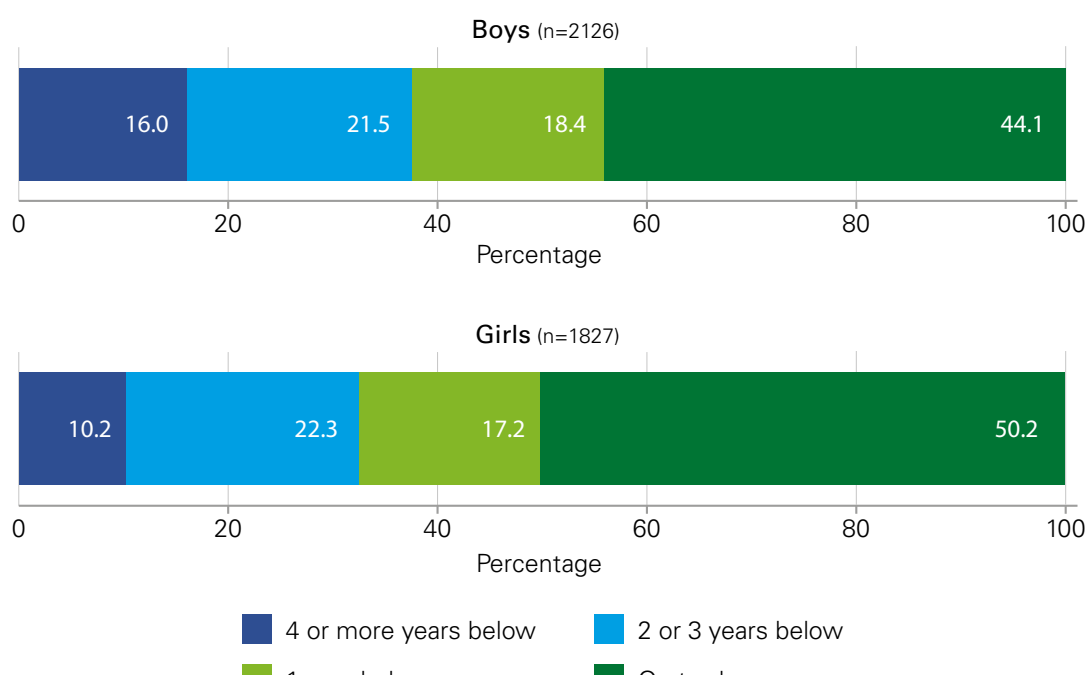
And what is the effect of repetition? School entry age in Mozambique is 6 years, yet students 10 years or older constitute a sizeable share (around 15 per cent) of children in grade 1. Except for grade 2, the percentage of students of the expected age for any given grade falls steadily. This indicates that students are not progressing from grade to grade. Moreover, previous studies in the country have found that over-age students face a higher probability of dropout (Wils, 2004). Confirming this last relationship, results of a hierarchical logistic model indicate that students repeating the grade faced a 4 per cent higher probability of dropout (see Annex 1).

<sup>11</sup> The methodology in 2018 was based on what the teacher reported for the selected children. The second wave of ALDE took advantage of its longitudinal nature and compared the grade registered for each child in 2018 and 2019. If the grade registered in 2019 was the same as the grade registered in 2018, the child was classified as repeating the grade. This method reduced any possible recall error bias.

### Box 3: Educational attainment in ALDE 2019

Educational attainment is measured by whether a child is in the expected grade for the reported age. The overall percentage of students on track (students in the expected grade for their age) remained relatively stable between 2018 and 2019. For girls, the percentages barely changed from 50 per cent in 2018 to 50.2 per cent in 2019. For boys, there was a slight reduction, from 45 per cent in 2018 to 44.1 per cent in 2019. The only relevant variations took place for boys one year behind (from 16 per cent in 2018 to 18.4 per cent in 2019) and two years behind (from 24 per cent in 2018 to 21.5 per cent in 2019). There is a dynamic element in educational attainment as the share of children lagging increases as they grow older. While 100 per cent of both boys and girls are on track when they are up to 7 years old, 34.4 per cent of girls and 46.7 per cent of boys are four or more years behind by the time they are 13 years or older.

Box Figure 3: School attainment, by gender



Source: ALDE, 2019.

Nonetheless, the largest inequality in terms of school attainment comes from the location of the household of the students: 77.8 per cent of children in the Southern region are on track, compared with only 32.9 per cent of children in the Northern and 44.6 per cent of children in the Central regions. There is a 20-percentage-point difference in the number of children on track in urban areas compared with rural children. These differences in educational attainment deserve special consideration as over-age students can struggle in social interaction, make classroom management challenging and disrupt the learning of younger students (Balfanz et al., 2007).

## 4. Dropout rates and the socio-economic characteristics of the household

### Key findings

- **Children in female-headed households have lower dropout rates.** The dropout rate for children living in households headed by a female is 12.2 per cent, compared with a dropout rate of 15.4 per cent for children living in male-headed households. The effects are stronger for girls, whose risk of dropping out falls from 15.9 per cent when living in a male-headed household to 11.2 per cent when in a female-headed household.
- **The association between household wealth and dropout rates is stable until the highest two quintiles of wealth distribution.** While dropout rates remain around 16 per cent for the first three quintiles, they fall to 7 per cent and 3.2 per cent for the highest two quintiles of the wealth distribution respectively.
- **Children who work are more likely to drop out.** This is true for both paid and unpaid work. The dropout rate for children engaged in paid work is more than twice the rate for children not engaged in paid work. The dropout rate increases from 10.6 per cent to 17.9 per cent when children are engaged in unpaid work.
- **In urban areas, increased vulnerability to environmental, economic, household composition and conflict/violence shocks was associated with dropout.** Children living in urban households exposed to any shock had a dropout rate three times higher than the children living in urban households that were not exposed to such shocks.
- **Inadequate access to basic necessities, such as nutrition and water, sanitation and hygiene (WASH) services, contributes to dropout rates.** Children living in households where members had only one meal were twice as likely to drop out than children in households where members had three meals over the same period. For households without access to water and sanitation services, children were almost five times more likely to drop out than children who could access these services.
- **Parental expectations and the value placed on education can influence dropout rates.** The dropout rates of children whose parents do not expect them to go to school are three times higher than for children whose parents expect them to attend. Dropout rates increase from 14.6 per cent to 28.8 per cent when parents do not think school is useful for their child's future.

This section explores how household-level factors relate to dropout rates in ALDE 2019. Data on households' socio-economic characteristics and family composition was collected through one questionnaire administered to the head of the household where the selected child lives.

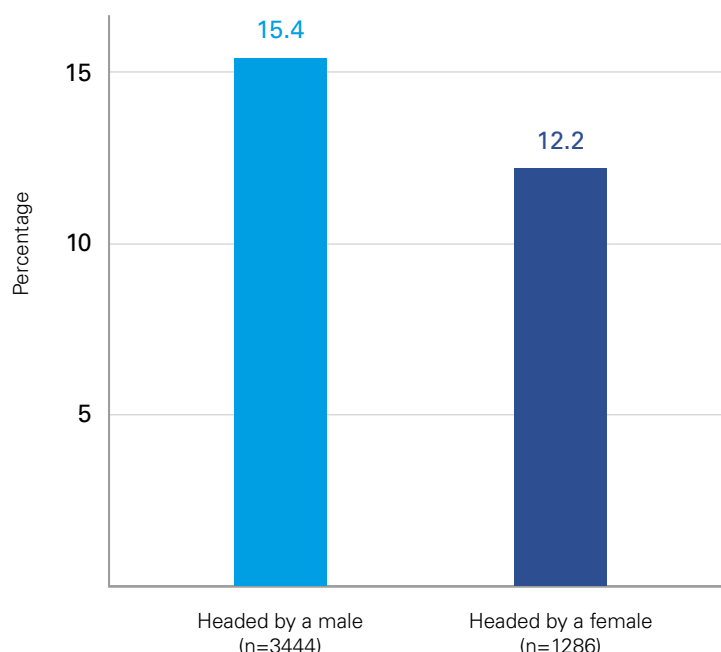
### 4.1. Dropout rates and the characteristics of the head of the household

In ALDE 2019, 73 per cent of the children lived in a household headed by a male. Households headed by a male are larger (6.1 members) than households headed by a female (4.8 members).<sup>12</sup> Children living in a household headed by a male exhibit higher dropout rates than those in female-headed households (see Figure 5),<sup>13</sup> which is in line with findings from previous research (Mambo et al., 2019).

<sup>12</sup> This difference is highly significant with a t-statistic of -14.32 and a p-value of 0.

<sup>13</sup> The difference is highly significant with a t-statistic of -3.0 and a p-value of 0.003.

Figure 5: Dropout rates, by gender of the head of the household



Source: ALDE, 2019.

While boys and girls in male-headed households are at equal risk of dropping out at around 15 per cent, there is a highly significant difference in dropout rates by gender in favour of girls when living in a female-headed household (11.2 per cent for girls and 13.3 per cent for boys).<sup>14</sup> A lower risk of dropout for girls in female-headed households may be associated with increased autonomy and participation in decision-making, although this relationship may be limited by the economic and time constraints that female-headed households may face (see Shahidul and Karim, 2015).<sup>15</sup>

The level of education attained by the head of the household can influence the economic outcomes of the family and serves as a benchmark for parental involvement and support for the education of the children (Foley et al., 2014). ALDE 2019 shows that children in households where the head attained only full or partial primary education were twice as likely to drop out than children in households where the head had attained secondary education (16 per cent and 8 per cent respectively). Most of the households headed by people with full or partial completion of primary school are in the less economically developed Northern region.<sup>16</sup> Interestingly, the dropout rate of children living in households headed by a person with no education is 10.1 per cent, which is lower than the rates for households where the head had attained some or full primary education. This may be attributed to differences in labour market outcomes, as unemployment rates for heads of households with no education are lower than for those who had achieved some level of primary or secondary education. The results of a hierarchical model indicate that children in households headed by an

<sup>14</sup> The t-statistic is -3.02 with a p-value of 0.003.

<sup>15</sup> Overall, households headed by a female tended to be better off than households headed by a male: 21.9 per cent of households headed by males were in the lowest wealth quintile, compared with 16.9 per cent of the households headed by a female.

<sup>16</sup> Two other possible hypotheses were tested with the data. First, no significant differences were found when comparing the opinions on education by the education attained by the head of the household. Second, there were differences in terms of observed attendance rates by the education of the head of the household. Children living in a household headed by a person with no education have an observed attendance mean of 62.6 per cent, which is higher than the observed attendance mean of the children living in households headed by a person with incomplete primary education (49.3 per cent) and for those living in a household headed by a person with complete primary education (59.9 per cent). More qualitative data is needed to fully understand the relationship between the dropout rates and the education of the head of the household.

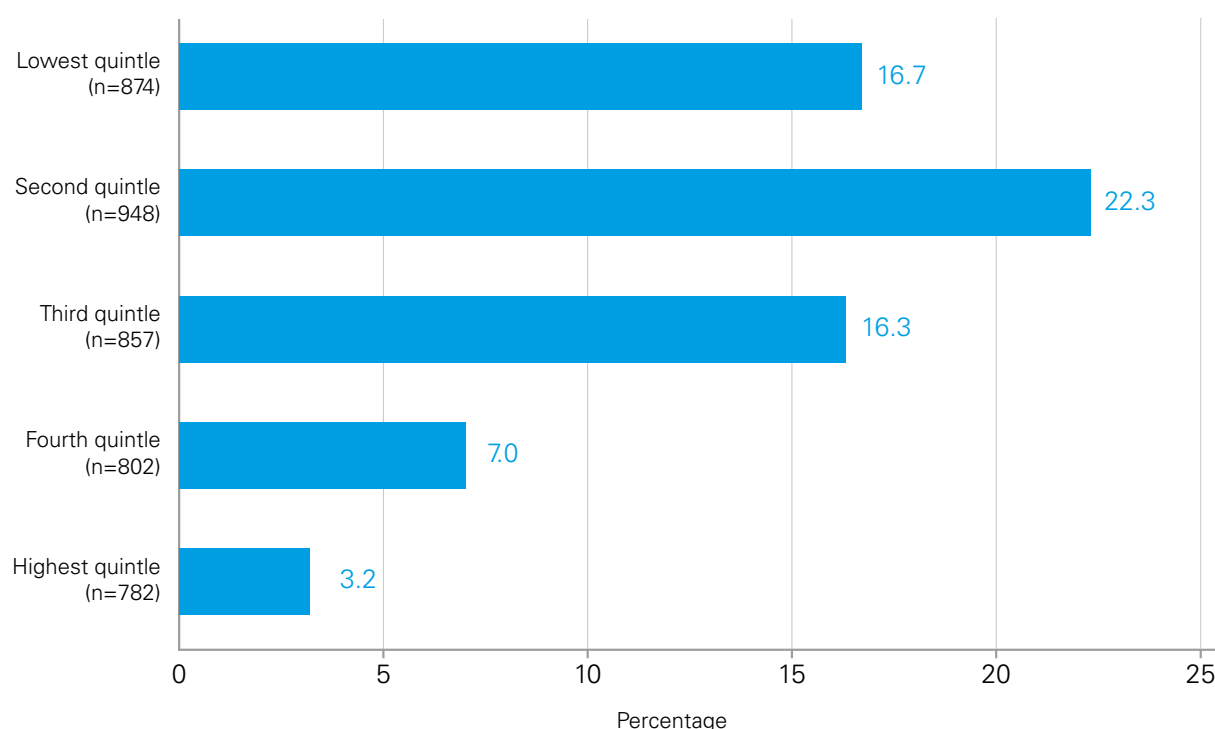


unemployed person had a 5 per cent higher probability of dropout once other variables are controlled for (see Annex 1).

## 4.2. Dropout rates and household wealth

The relationship between the wealth quintile<sup>17</sup> of the household and the dropout rate resembles the findings of the level of education of the head of the household (see Figure 6).<sup>18</sup> Children in the lowest wealth quintile have a lower dropout rate than children in the second wealth quintile and a very similar rate for children in the third quintile. The same pattern is seen even when disaggregating the wealth of the household by the gender of the children and by urbanicity. Higher dropout rates for the second wealth quintile may be associated with housework, as 91 per cent of children in the second quintile engage in housework, compared with only 86 per cent of children in the lowest quintile.<sup>19</sup> Further analysis and qualitative research are needed to better understand the contributing factors.

Figure 6: Dropout rates, by wealth quintile



Source: ALDE, 2019.

## 4.3. Dropout rates and child labour

Households face difficult trade-offs when deciding whether to send their children to school or to work. To better understand child labour, ALDE collects data about children's engagement in housework, unpaid work

17 The Demographic Health Survey (DHS) calculates a composite measure of cumulative living standards, known as the wealth index, using information on household ownership of assets, materials for housing construction and access to services. Implementing a principal component analysis on the data, the index places individual households on a continuous scale of relative wealth, which is further divided in five groups (quintiles). For more information, see <<https://dhsprogram.com/topics/wealth-index/>>.

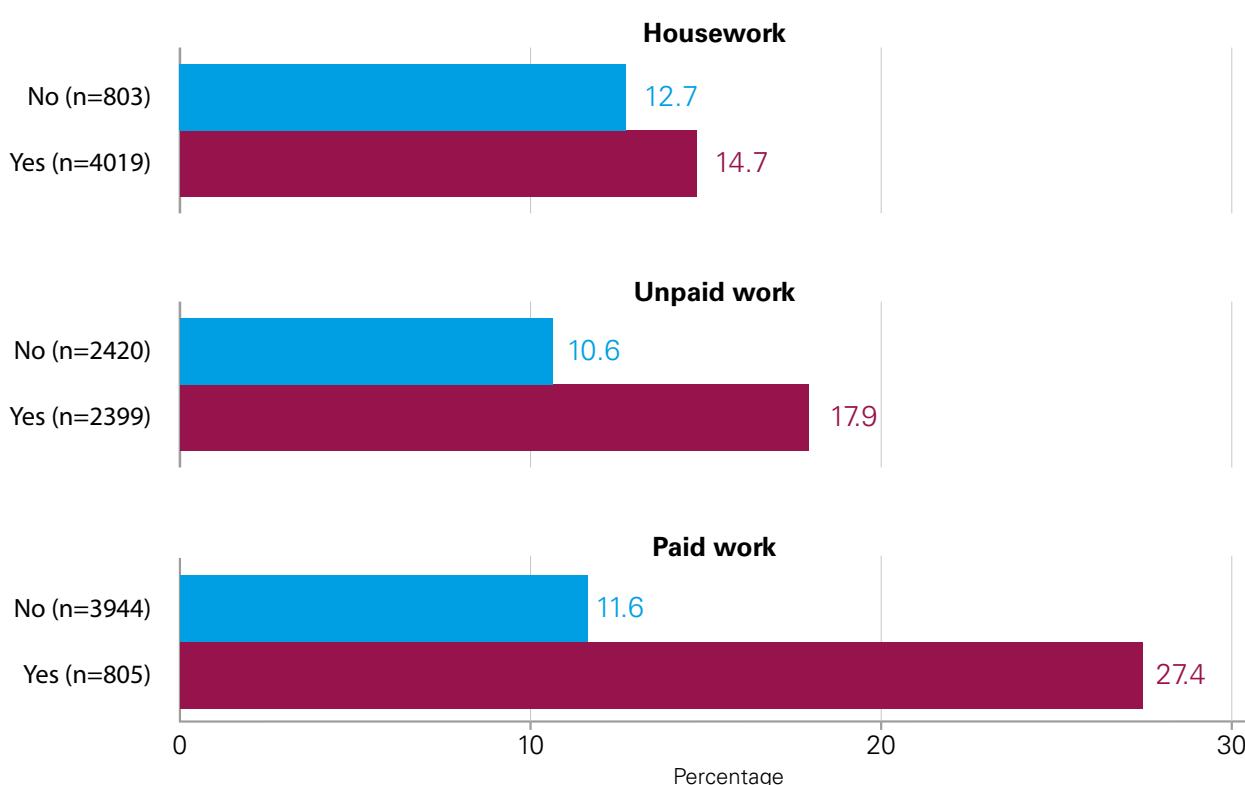
18 In a simple regression, having the wealth index quintile as dependent variable, the coefficient on the education of the head of the household (increasing according to the level attained) is highly significant (t-statistic is equal to 21.45 with a p-value of 0).

19 That difference is highly significant with a t-statistic of 2.85 and a p-value of 0.004.

and paid work. In 2019, it finds that 82.7 per cent of children are engaged in housework, 48.4 per cent in unpaid work and 16.6 per cent in paid work. Paid work is more prevalent for children in the Central region (21.3 per cent) than among the children in the Northern (18.9 per cent) and the Southern (4.7 per cent) regions. Unpaid work is more common for children in the Northern region (53.2 per cent) than for their counterparts in the Central (48.7 per cent) and Southern (35.7 per cent) regions. Children in rural areas were significantly more likely to engage in all types of work: 84.4 per cent of rural children compared with 69.1 per cent of urban children engaged in housework, 52.6 per cent compared with 25.7 per cent in unpaid work, and 17.5 per cent compared with 5.7 per cent in paid work (see Figure 7).

The differences in dropout rates for children engaged in unpaid or paid work are highly significant.<sup>20</sup> As children get older, they are more likely to engage in both paid and unpaid work, increasing their risk of dropout: 64.3 per cent of children in the 13 years and older age group have unpaid work, compared with 22.9 per cent of the children in the 7 years or younger age group. Likewise, more children in the oldest age group (30.7 per cent) than children in the youngest age group (5.3 per cent) had paid work. Moreover, around a quarter of the children with unpaid work are also conducting paid activities.

Figure 7: Dropout rates, by type of work performed by the child



Source: ALDE, 2019.

#### 4.4. Dropout rates and household vulnerability to shocks

Owing to its location and geography, Mozambique is highly vulnerable to climate shocks. The country has been affected by 27 flood events, 16 tropical cyclones and 12 droughts between 1980 and 2016 (see Queface, 2017; Global Risk Identification Programme, 2010). The frequency and severity of natural disasters are expected to rise as a result of climate change (Irish Aid, 2018). These natural disasters threaten to

<sup>20</sup> For unpaid work, the difference is significant at a 1 per cent level with a t-statistic of 7.33 and a p-value of 0. The difference for paid work is also significant at a 1 per cent level, with a t-statistic of 9.58 and a p-value of 0.

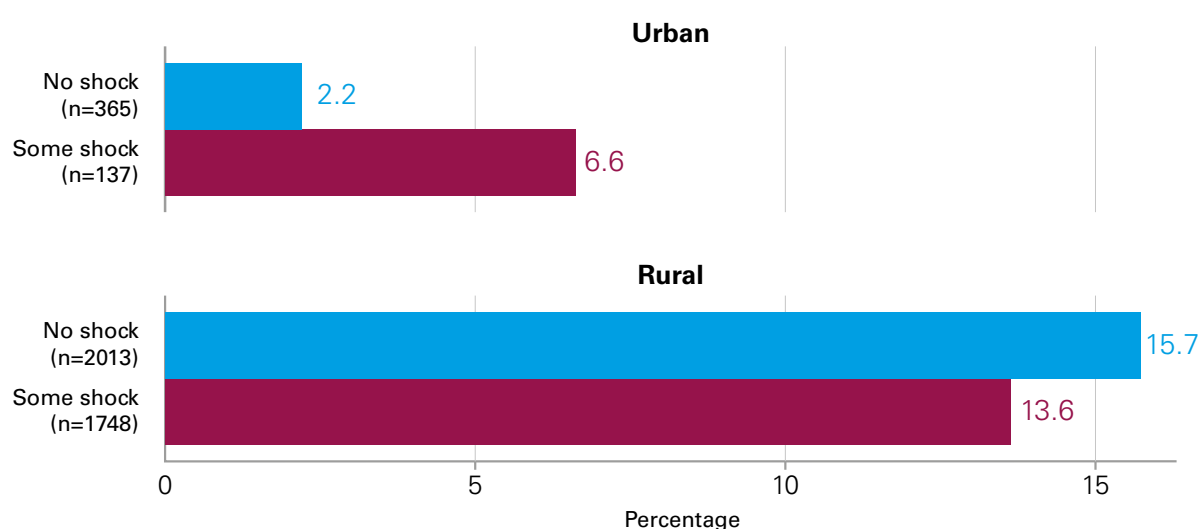
increase the vulnerability of households, especially those in rural areas and from poorer backgrounds. In Mozambique, 66.6 per cent of the population live in rural areas and 62.9 per cent live on less than US\$1.9 a day (Ministério de Educação e Desenvolvimento Humano, 2020).

During the year before the survey, 42.1 per cent of the children experienced a shock to their households.

<sup>21</sup>Children in rural areas were twice as likely to have experienced a household shock than children in urban areas, with the most common shocks being droughts and rains (19.4 per cent) and heavy winds and cyclones (13.2 per cent). More children in the Central region live in households that suffered from droughts and rains (30.7 per cent) and heavy winds or cyclones (22.9 per cent).<sup>22</sup>

Experiencing a shock in the household increased the dropout rate of children living in urban areas from 2.2 per cent to 6.6 per cent (see Figure 8). The relationship between dropout and exposure to shocks is only significant in urban areas.<sup>23</sup> Households of the children in urban areas may not have the support networks that provide coping strategies (such as mutual assistance, gifts or loans, labour pooling, child fostering, information exchange on job or business opportunities, among others) (Helmy and Roushdy, 2019). Additionally, shocks may be particularly harmful in urban areas as prices are 21 per cent higher than the national average (World Bank, 2017).

Figure 8: Dropout rates, by location and by experiencing a shock in the household



Source: ALDE, 2019.

## 4.5. Dropout rates and deprivation

Households experience deprivation when they lack access to essential services or goods. Examining deprivation can be more representative than looking at income level alone, as it addresses known mismatches between income and other dimensions of living standards (Cardoso et al., 2016). Not having the right conditions or the goods needed to go to school has been previously identified as a cause of dropout

<sup>21</sup> Specific questions are asked about environmental shocks (such as heavy winds, drought, flood, pests), economic shock (such as high production costs, low output prices, high education costs), household composition (death, separation, dowry payment) and conflict and violence.

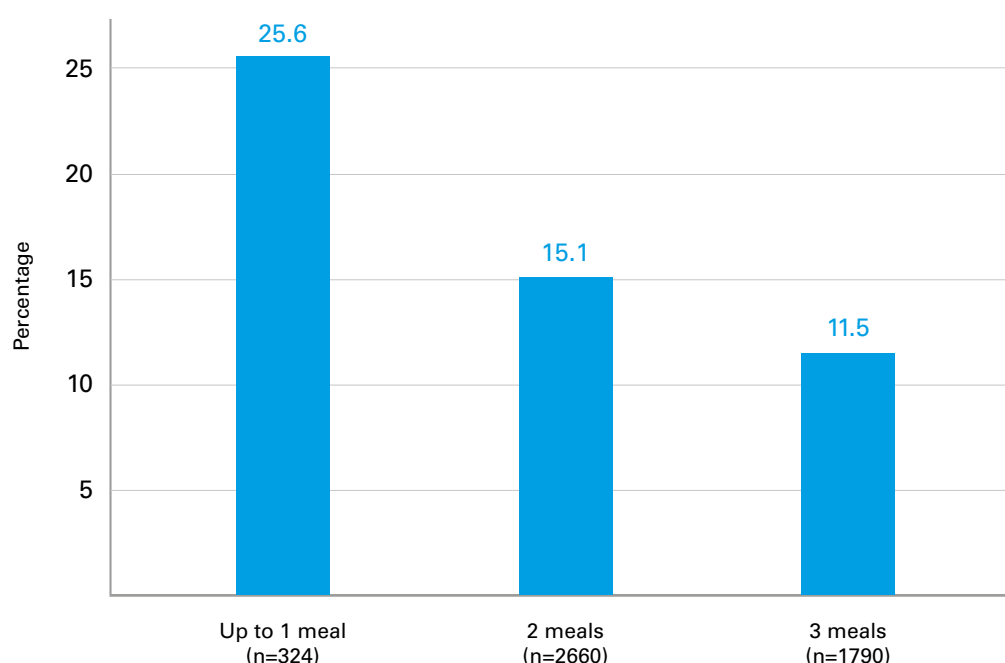
<sup>22</sup> ALDE 2019 was collected after the devastating effects of hurricanes Idai (in the provinces of Sofala, Manica and Zambezia) and Kenneth (in the province of Cabo Delgado), which brought uncommon levels of destruction, especially to the central region of the country.

<sup>23</sup> The difference in urban areas is significant at a 5 per cent level (t-statistic of 1.97 and a p-value equal to 0.049). The difference in rural areas is only significant at a 10 per cent level (t-statistic of -1.81 and a p-value of 0.071).

(Chirtes, 2010). Deprivation can have an impact on educational outcomes, especially during the early years of life, and increase the likelihood of dropout by the age of 16 (Pirrie and Hockings, 2012).

One element of deprivation is food access in the household. ALDE collects data on the number of meals that household members had during the day before the survey. Higher food deprivation, represented by a smaller number of meals consumed, is associated with a higher dropout rate (see Figure 9).<sup>24</sup> Comparing data from ALDE 2018 and 2019, the number of children in households where members had three meals decreased from 40.1 per cent in 2018 to 37.1 per cent in 2019. Food deprivation is experienced differently in the regions across the country. While only 27.3 per cent of children in the Northern region live in households where members had three meals on the day before the survey, this figure increases to 45.4 per cent of children in the Central and 51 per cent of children in the Southern regions. Higher dropout rates associated with food deprivation call for programmes targeting schools and households to reduce malnutrition and short-term hunger (Sarker et al., 2019).

Figure 9: Dropout rates, by number of meals in the household



Source: ALDE, 2019.

Other types of deprivation are also associated with dropout rates. Children living in households with low levels of access to blankets, clothes and shoes have higher dropout rates.<sup>25</sup> For instance, dropout rates for households with low levels of access to clothes (20.8 per cent) and shoes (17.9 per cent) are significantly higher than the rates for children in households with high access levels to these items (12.9 per cent and 11.8 per cent, respectively).<sup>26</sup> Additionally, the dropout rate for the children without access to a mosquito net (13 per cent) is higher than the rate for the children with access (8.9 per cent).<sup>27</sup> Importantly, the prevalence

<sup>24</sup> The differences are highly significant: i) the difference in the dropout rate between up to one meal and two meals is significant at a 1 per cent level (t-statistic of -4.18 with a p-value of 0); ii) the difference in the dropout rate between two meals and three meals is significant at a 1 per cent level (t-statistic of 3.57 with a p-value of 0).

<sup>25</sup> The number of household members with access to the selected item is divided by the total number of household members. Then, the ratio is classified in three levels: low household access (up to 25 per cent of household members), medium household access (between 25 per cent and 50 per cent of household members) and high household access (more than 50 per cent).

<sup>26</sup> All differences are significant at a 1 per cent level as the p-values are equal to 0.

<sup>27</sup> The difference is significant at a 1 per cent level, with a t-statistic of -4.37 and a p-value of 0.

of dengue and malaria is large (43.9 per cent of the children had contracted the disease during the year before the survey) and this has been associated with lower levels of educational attainment and learning, either through iron deficiency (after repeated attacks) or high absenteeism (Ayi et al., 2010).

The final kind of deprivation examined is access to school and learning materials in the household. Evidence from developing countries has shown that access to school materials and reading materials in the household is associated with better achievement levels (Walker et al., 1998). ALDE 2019 data shows that children without access to a pen and paper at home have a dropout rate (25.3 per cent) nearly three times higher than the rate for the children with access to these items (9.3 per cent).<sup>28</sup>

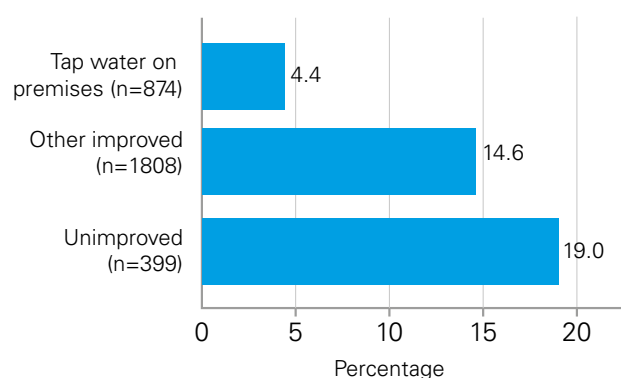
#### 4.6. Dropout rates and access to WASH services at home

Children in low-income countries are at a higher risk of WASH-related infections causing diarrhoea-type diseases, soil-transmitted helminths and trachoma due to crowded and unsanitary conditions that result in fewer days of schooling and, eventually, dropout (Chard et al., 2019). In ALDE 2019, access to water and sanitation in the data is classified according to the type of water source<sup>29</sup> and the type of sanitation at home.<sup>30</sup> It found that 19.3 per cent of the children live in households with access to tap water at home, while 42.2 per cent have access to unimproved sources. As for sanitation services, 23.5 per cent of children do not have access to sanitation services at home, and only 4.9 per cent have access to a flushing toilet at home. These figures hide the large differences between rural and urban areas and across the regions.<sup>31</sup>

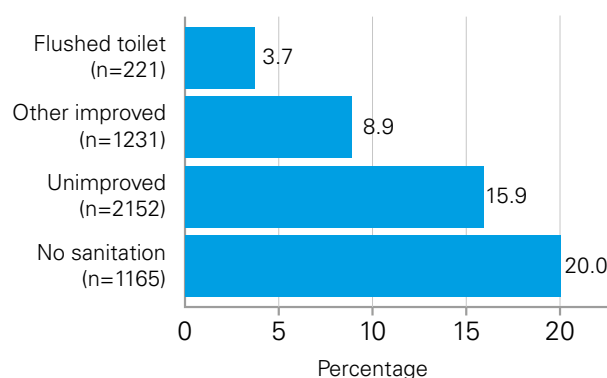
The children with access to unimproved water sources and the children with no sanitation service at home experience a dropout rate that is around five times greater than the rate for children with access to tap water and for children with access to a flushing toilet (see Figure 10).

Figure 10: Dropout rates, by type of access to WASH services

##### a) Type of water source at home



##### b) Type of sanitation service at home



Source: ALDE, 2019.

28 Significantly higher dropout rates were also associated to lack of access to homework material (38.4 per cent) and textbooks (44.8 per cent) at home. All differences were significant at a 1 per cent level as the p-value is equal to 0.

29 The water source classification has been made following World Health Organization guidelines: <[https://www.who.int/water\\_sanitation\\_health/monitoring/water.pdf](https://www.who.int/water_sanitation_health/monitoring/water.pdf)>. Unimproved drinking water sources are: unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck and surface water (river, dam, lake, pond, stream, canal, irrigation channels), bottled water. Other, improved drinking water sources are: public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection. Sources of piped water on premises are: piped household water connection located inside the user's dwelling, plot or yard.

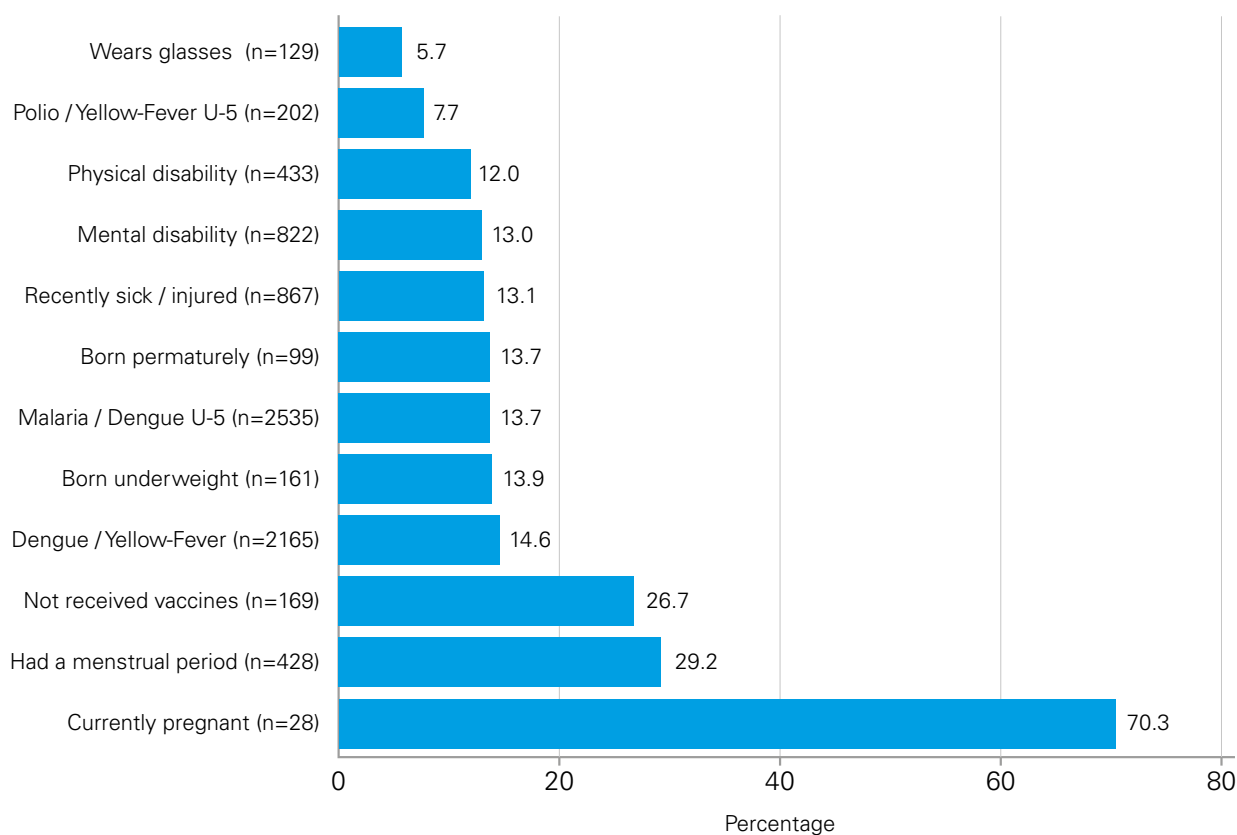
30 The sanitation services classification follows the World Health Organization guidelines: <[https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-using-improved-sanitation-facilities-\(-\)>](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-using-improved-sanitation-facilities-(-)>).

31 In terms of urban and rural differences, children living in urban households have higher access to tap water at home than those living in rural areas (46.6 per cent vs. 14.8 per cent) and the same is true in terms of access to a flushing toilet at home (18.7 per cent for the urban children compared with 2.4 per cent for the rural children). Regional differences indicated that more children in households located in the Southern region have access to tap water (57.2 per cent) and a flushing toilet (16.9 per cent) than the children of households in the Northern region (only 9 per cent have access to tap water and 2 per cent have access to a flushing toilet).

## 4.7. Dropout rates and children's health

A child's health and well-being influence school retention and attainment (Bundy et al., 2018). While health is a child-level factor that could influence dropout rates, its analysis is included in the household-level factors since parents and caregivers are often the primary decision-makers for children when accessing health services. Thus, ALDE survey data collected from caregivers on children's health factors was used to compute health-related dropout rates (see Figure 11).<sup>32 33</sup>

Figure 11 : Dropout rates, by selected health indicators



Source: ALDE, 2019.

<sup>32</sup> Significant differences, although of the contrary sign (i.e., children that experienced the disease/condition had a lower dropout rate than those that did not) were found for wearing glasses (t-statistic equals -4.51 with a p-value of 0), polio or yellow fever over the last year (t-statistic equals -3.89 with a p-value of 0), physical impairment (t-statistic equals -1.75 with a p-value of 0.08) and having malaria or dengue over the last year (t-statistic equals -2.02 with a p-value of 0.044). Also significant and of the expected sign (i.e., children experiencing the disease/condition have a higher dropout rate) were found for not getting vaccinated (t-statistic equals -3.74 with a p-value of 0), having had a menstrual period (t-statistic equals 7.73 with a p-value of 0) and being currently pregnant (t-statistic equals 6.38 with a p-value of 0). Small sample sizes and problems in the reporting of the health indicators call for caution when analyzing these indicators.

<sup>33</sup> Figures presented have to be taken with caution. First, they can be underreported due to recall error (especially for diseases contracted during early years of life). Second, and especially since access to health services is low because of high costs of treatments or distance to a health-care facility, some diseases may not be properly identified by the caregiver. Third, other types of diseases may be taking place and they were not asked for in the questionnaires. The data may be revealing a bias in the responses, as the dropout rate of children who have not experienced any of the diseases or the disabilities included in the questionnaire, at 15 per cent (not including sexual and reproductive health indicators for girls, such as having had a menstrual period or being currently pregnant, as these are exclusive for women in the older age groups), is similar to the national rate (14.7 per cent) and higher than most of the dropout rates associated with the health factors considered in the survey.

Sexual and reproductive health-related factors have the highest association with dropout, with 70 per cent of pregnant girls and 29 per cent of girls who have reached menstruation dropping out of school. Reproductive health becomes a more relevant obstacle for older girls. Age is a driving factor of dropout for girls in the Northern and Central regions, where 30.5 per cent of girls were 13 years or older (compared to only 13 per cent in the Southern region). Targeted retention policies for girls should focus on their health and reproductive education, since staying in school protects girls from early marriage, teenage pregnancy and HIV infection (Zulaika et al., 2019).

Lower levels of vaccination were also associated with higher dropout rates, which is consistent with studies that have shown that vaccination increases educational attainment in poor and largely rural African communities (Anekwe et al., 2015). While 96.6 per cent of the children were vaccinated, unvaccinated children had a dropout rate of 26.7 per cent, compared with only 14 per cent for vaccinated children. These unvaccinated children mainly live in the Northern region of the country.

## 4.8. Dropout rates and parental expectations

Parents with higher educational expectations for their children and who place a higher value on education are more likely to transmit the importance of doing well in school and to indirectly influence children's behaviours and achievement (Zhan, 2006). In Mozambique, the low value that society and communities place on education is a major determinant of low school attendance and high dropout rates (Nivagara et al., 2016).

ALDE surveyed caregivers about their level of agreement with different statements regarding their expectations for the educational attainment of their children.<sup>34</sup> Dropout rates are significantly larger in households when caregivers do not believe that their child will return to school or complete school (up to secondary education), and when caregivers do not perceive school as being useful for their child's future.<sup>35</sup> Parental expectations did not vary significantly from 2018 to 2019. The percentage of caregivers agreeing with the statements on parental expectations remained almost the same for whether the child will return to school (88.5 per cent in 2018 and 88.2 per cent in 2019) and on whether education is useful for the future (99.1 per cent in 2018 and 97.7 per cent in 2019). Only parents' expectations of their child completing secondary education changed, increasing from 69.1 per cent in 2018 to 79.9 per cent in 2019, even though 14.7 per cent of children dropped out of school.

Household location is the key variable driving these differences. In the Northern region, 15.5 per cent of caregivers do not expect their children will return to school, compared with 7 per cent in the Central and 4.5 per cent in the Southern regions respectively. More caregivers in rural areas believe that their child will not return to school (12.6 per cent) and that the child will not complete education (24.3 per cent) than caregivers in urban areas (5.2 per cent and 17.9 per cent respectively).<sup>36</sup> Age can also play a role. Only 2.2 per cent of the caregivers of children in the youngest age group (up to 7 years) do not think their child will return to school, but that percentage increased up to 20.5 per cent for the caregivers of children in the oldest age group (13 years or older).

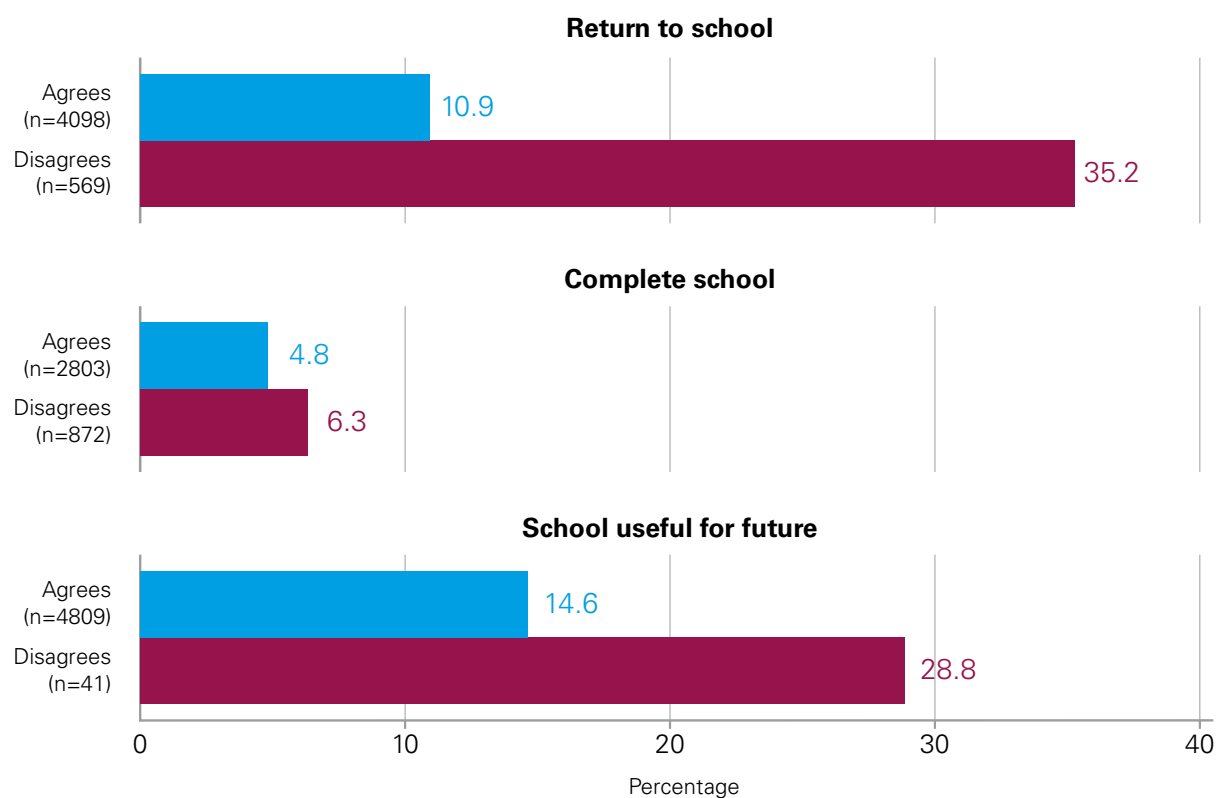
34 ALDE asks the level of agreement of the caregiver on: i) whether the child will return to school; ii) whether the child will complete high school; iii) whether the caregiver considers school is useful for work; iv) whether the school is useful for the future; v) whether school helps with decision-making; and vi) whether it is important to engage in school. Here, only the results of the significant differences in dropout rates are presented and discussed.

35 The difference regarding whether the child will return to school is significant at a 1 per cent level (the t-statistic is 11.79 with a p-value of 0.000). This difference regarding whether the child will complete school is only significant at a 10 per cent level (t-statistic of 1.68 and a p-value of 0.093). Finally, the difference related to the usefulness of school for the future is significant at a 5 per cent level (with a t-statistic of 2.01 and a p-value of 0.045).

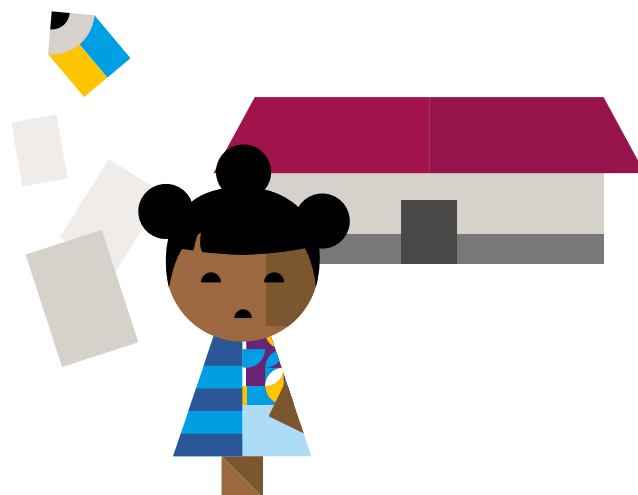
36 These differences are highly significant, with t-statistics of 6.59 and 3.33, with associated p-values equal to 0, respectively.



Figure 12: Dropout rates, by type of agreement on education value statements



Source: ALDE, 2019.



## 5. Dropout rates and school-level factors

### Key findings

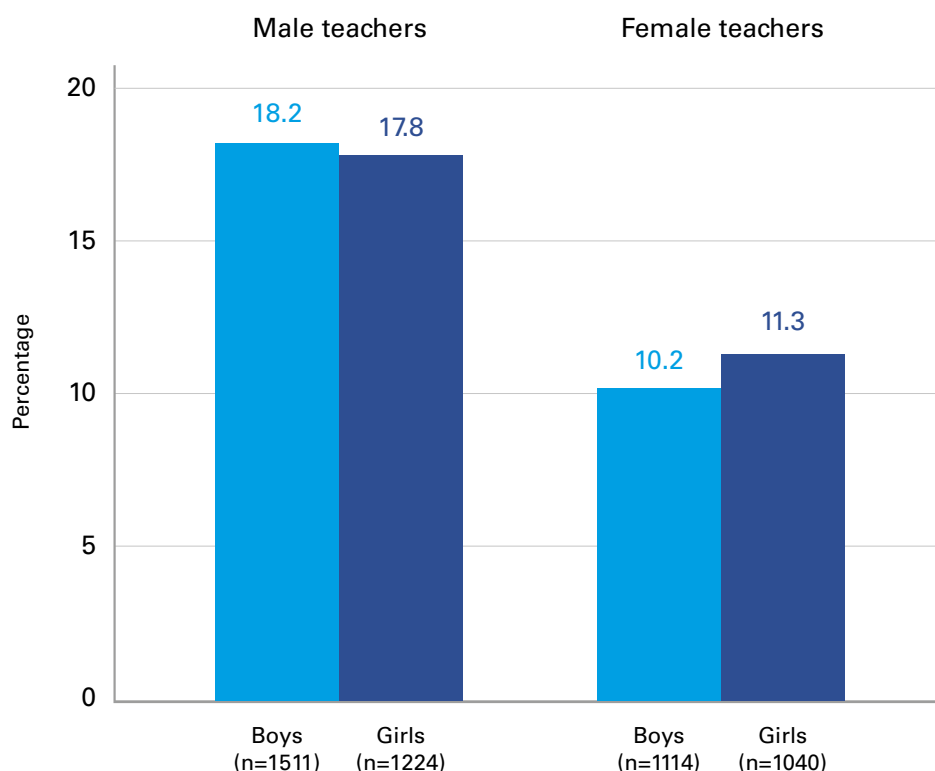
- **Having a female teacher is associated with lower dropout rates.** The dropout rates of the boys and girls with a female teacher (10.2 per cent and 11.3 per cent respectively) are lower than the dropout rates of the boys and the girls with a male teacher (18.2 per cent and 17.8 per cent respectively). However, more children in urban areas and in the Southern region (53.4 per cent and 60 per cent respectively) have a female teacher than children in rural areas and in the Northern region (45.4 per cent and 42 per cent respectively).
- **School leadership influences retention rates.** When directors were present at school for more than 80 per cent of their working days, dropout rates are equal to 7.5 per cent; however, the dropout rate doubles in schools where directors were absent for 20–60 per cent of their working days.
- **Having a female school director is associated with lower dropout rates.** Schools led by women tended to have lower dropout rates than schools led by men (8.2 per cent and 14.2 per cent respectively).
- **Increased community and parental engagement in school management can help reduce dropout.** In schools where the school councils met four or more times during the year, 8.8 per cent of children dropped out. Where the school council met three times or fewer during the year, 10.6 per cent of children dropped out.
- **Consistent school closures are associated with increases in student dropout.** Schools that are open for less than 85 per cent of the days on which enumerators visited had dropout rates that were three times higher than for schools that were open for 95 per cent of the visits.
- **Larger student–teacher ratios are associated with increased dropout.** In classrooms with fewer than 60 students per teacher, dropout rates were 11.2 per cent. However, when class sizes increased to 79 or more students per teacher, the dropout rate rose to 17.6 per cent.
- **Improved access to school infrastructure is linked to lower dropout rates.** Using an index of access to school infrastructure, children with lower levels of access (21.4 per cent) were three times more likely to drop out of school than children with higher levels of access (7.4 per cent).
- **Access to drinking water and students' exclusive toilets at school is related to lower dropout rates.** There is an associated reduction in dropout rates when students have access at the school to drinking water (from 13 per cent to 6.3 per cent) and to exclusive toilets (from 16.8 per cent to 8.4 per cent). Nevertheless, most students were at schools where the drinking water (75.9 per cent) and sanitation facilities (87.3 per cent) needed repairs and better maintenance.
- **Feeling safe at school matters for school retention.** Children who do not feel safe at school have a dropout rate more than twice the rate of children who do feel safe (28.8 per cent and 13.1 per cent respectively).

To analyze the school-level factors associated with dropout, ALDE administers questionnaires to school directors and the child's teacher. The role of school management and the school environment in enhancing learning and improving retention is analyzed in the following sections.

## 5.1. Dropout rates and the role of the teachers

Regardless of gender, students with a female teacher are less likely to drop out than students with a male teacher (see Figure 13). The percentage of children with a female teacher remained relatively constant between 2018 (45.8 per cent) and 2019 (46.7 per cent). Previous findings from ALDE in 2018 found a similar association between having a female teacher and the student's attendance and attainment. Gender-specific attitudes to teaching methods and students' gender roles (Amadi et al., 2013) can increase students' academic expectations and motivation (Dee, 2005). However, part of this relationship is explained by the school's location. In urban areas, 53.4 per cent of the children have female teachers, compared with 45.4 per cent in rural areas. In terms of regional differences, ALDE 2019 indicated that while 60 per cent of the children in the Southern region had female teachers, that percentage was 42 per cent in the Northern region.

Figure 13: Dropout rates, by gender of teacher and by gender of children



Source: ALDE, 2019.

Female teachers tended to have higher levels of education than male teachers, which could explain some of the differences in dropout rates. Female teachers were 7 percentage points more likely to have completed secondary school education and 5 percentage points more likely to have a graduation degree than male teachers. The association between the teacher's gender and dropout rates exists even though female teachers, on average, have fewer years of teaching experience (8.8 years) than their male counterparts (10.3 years).<sup>37</sup> This is different from the results of the 2018 ALDE report, which showed a positive association between the years of experience of teachers and students' outcomes, such as in attendance and attainment.

Teacher attendance is another variable often examined alongside student dropout rates. However, ALDE 2019 finds no significant relationship between teachers' attendance and student dropout rates.<sup>38</sup> Evidence

<sup>37</sup> The difference in teaching experience is significant at a 1 per cent level (t-statistic is equal to -2.63 and the p-value is 0.009).

<sup>38</sup> A relationship was found when using the school average teacher's observed attendance mean, but this measure may not be appropriate since students may not interact with several teachers at their school during their daily activities.

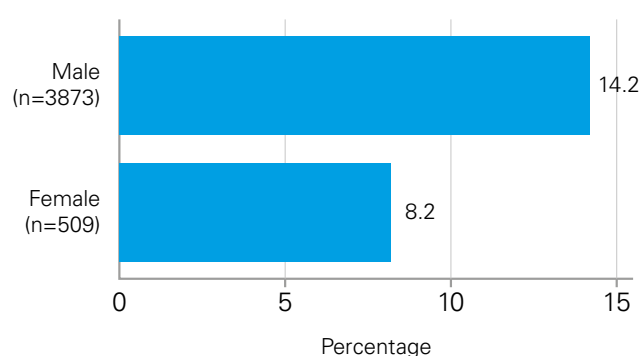
from Mozambique highlights the complexity of teacher absenteeism. Official figures (Ministério da Educação e Desenvolvimento Humano, 2020) suggest that children are receiving only 39 per cent of the instructional time that is required by the school calendar (190 days during the year) and that teachers are twice as likely to be absent from school if the school director is frequently absent. Two Service Delivery Indicator studies by the World Bank, from 2014 and 2018, suggest that teacher absenteeism in the country decreased from 45 per cent in 2014 to 28 per cent in 2018 (Bassi et al., 2019).<sup>39</sup> ALDE 2019 data presents similar results, with teachers absent from school 28 per cent of the time. This figure is higher than in 2018, where the absenteeism rate was 22.7 per cent. Regionally, teachers in the Northern and Central regions were twice as likely as teachers in the Southern region to be absent from their classrooms. Similar results are seen with urbanicity, with teachers in rural areas twice as likely as teachers in urban areas to be absent.

Failing to find this relationship calls for the application of a more comprehensive framework to map the pathways between teacher attendance and dropout, as teachers' absenteeism disrupts students' learning and performance (Obeng-Denteh, 2011). ALDE 2018 has already provided evidence on how school supervision can help reduce teacher absenteeism. UNICEF's Time-To-Teach study (Nugroho and Karamperidou, 2021) conducted a qualitative study of teacher absenteeism in Mozambique and found that its measurement needs to take into consideration the different causal processes. Therefore, authorities need to find a cost-effective way to monitor teachers' absenteeism and to implement actionable and accountable consequences for teachers (Nedungadi et al, 2018).

## 5.2. Dropout rates and the role of school directors

Children with a female school director have lower dropout rates than the children with a male school director (see Figure 14).<sup>40</sup> Yet only 15.4 per cent of children study at schools with a female director and the majority of these children live in urban areas and in the more developed Southern region. While 34.8 per cent of children in the Southern region have a female school director, the percentages are only 12.8 per cent in the Northern and 5.7 per cent in the Central regions. As a consequence, the association between the gender of the school director and dropout rates is not as strong as the association with the gender of the child's teacher.

Figure 14: Dropout rates, by gender of school director



Source: ALDE, 2019.

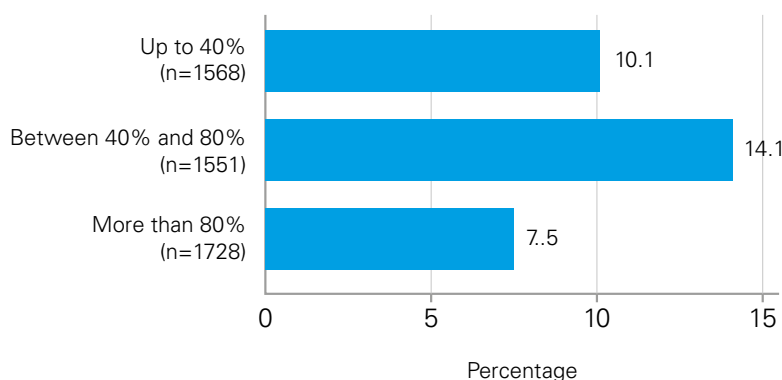
The relationship between the gender of the director and dropout rates may be explained by director attendance, which was monitored through unannounced spot-checks. On average, directors were absent from school 40 per cent of the time, which is slightly lower than the reported 44 per cent in the 2015 Service Delivery Indicators survey (Bassi et al., 2019), but represents an increase from the 32 per cent found in ALDE 2018. Female directors were around half as likely to be absent during unannounced visits than their male counterparts.

<sup>39</sup> Figures were obtained following random and unannounced visits to the schools, as in ALDE 2018.

<sup>40</sup> The difference is statistically significant at a 1 per cent level (t-statistic of -6.56 and a p-value of 0).

The relationship between observed director attendance and student dropout is not linear. The positive finding is that dropout rates are the smallest when the director is at the school 80 per cent of the time or more (see Figure 15).<sup>41</sup> There seems to be a positive relationship between directors' attendance and years of working experience, since directors with 12 or more years of working experience showed the highest attendance rates.

Figure 15: Dropout rates, by observed attendance mean of school director



Source: ALDE, 2019.

However, no linear relationship could be found between the duration of a director's work experience and the dropout rate. Children studying at schools with directors with three or fewer years of working experience had a dropout rate of 10.2 per cent, but the dropout rate reaches 13.4 per cent for children studying at schools with directors with four to eight years' working experience. Yet children studying at schools with directors with 12 or more years' working experience have a dropout rate of 6.3 per cent – it is only for this last group of students for which the association is highly significant.<sup>42</sup>

School directors play a critical role in the academic attainment of their students. For instance, school directors exhibiting negative behaviours, using oppressive attitudes and having poor communication are associated with higher student absenteeism and dropout rates (Sahin et al., 2017). While having a female director at the school shows negative associations with dropout rates, it is unclear from ALDE data which characteristics, attitudes or behaviours contribute to these effects. Having a female director at the school is not associated with a more female-friendly school infrastructure (such as gender-specific bathrooms available at school). However, female directors have higher levels of education attained.<sup>43</sup> It is possible that female directors are positive role models, particularly for girls, who set high expectations or provide a mothering-style of leadership that nurtures the aspirations and development of both teachers and students (Lumby and Azaola, 2014). However, more research is needed in this area on the role that a female school director has on educational attainment and learning outcomes for both girls and boys in the country.

### 5.3. Dropout rates and the school management

ALDE data examines two key activities related to school management: supervision visits and school council meetings. On average, schools received 2.7 supervision visits during 2019 compared with 3.1 in 2018. Urban schools were visited 3.2 times compared with the 2.6 times that rural schools were visited.<sup>44</sup> Although it seems that there is an association between the dropout rates and the number of supervision visits,

<sup>41</sup> This difference is significant at a 1 per cent level (t-statistic of -6.02 and a p-value of 0).

<sup>42</sup> The difference is significant at a 1 per cent level with a t-statistic of -3.35 and a p-value of 0.001.

<sup>43</sup> In terms of psycho-pedagogical training of the director, more female directors have attained 16 years or more years of training (33.3 per cent) compared with male directors (21.6 per cent).

<sup>44</sup> The difference is significant at a 1 per cent level (t-statistic is equal to -3.78 and a p-value of 0).

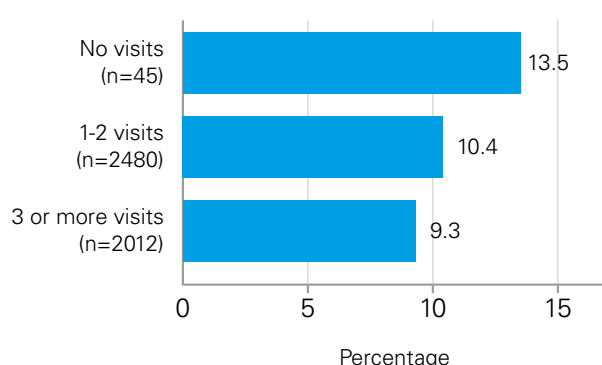
such an association is not significant (see Figure 16 panel a).<sup>45</sup> However, when using a hierarchical logistic model, it was found that the coefficient on this variable is positive and implies a 5 per cent increase in the probability of dropout as schools receive more of these visits (see Annex 1). It could be that schools facing more student retention difficulties and that are expected to have a higher dropout rate receive more visits during the year. For instance, the largest schools (those with more than 1,170 students) received the highest number of supervision visits on average (3.7 visits).

In 2019, 63.2 per cent of the students attended schools where the school council met three times or fewer during the school year, while the remaining 36.8 per cent attended schools where the council met four or more times. This compares with 58 per cent and 42 per cent respectively in 2018. Unlike the data for supervision visits, there is a relatively significant relationship between the number of school council meetings and dropout rates (see Figure 16 panel b).<sup>46</sup>

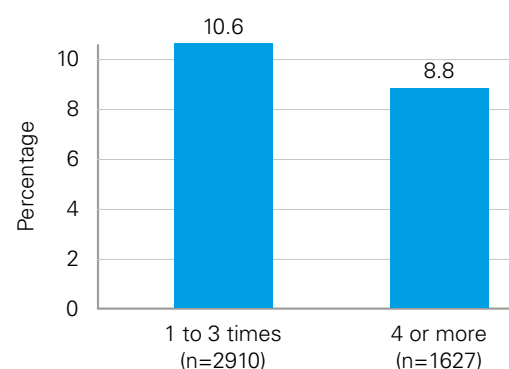
The association between the frequency of school council meetings and dropout rates suggests that high levels of community and parental participation and engagement can help improve school retention. In the newest version of the Education Sector Plan (Ministério da Educação e Desenvolvimento Humano, 2020), the role of councils in school management (and controlling teachers' absenteeism) is recognized, despite the existing limitations in their representativeness and effectiveness (see Taela et al., 2018).

Figure 16: Dropout rates, by number of supervision visits and school council meetings

**a) School supervision visits**



**b) School council meetings**



Source: ALDE, 2019.

## 5.4. Dropout rates and school working days

The unannounced and random visits of the enumerators to register the attendance of directors, teachers and selected children were also used to register whether the school was open. On average, schools were open 85.6 per cent of the times that enumerators conducted these spot-checks. This indicator has barely changed (it was 84.7 per cent in 2018). Schools in rural areas were open 84.4 per cent of the time that enumerators visited, lower than the 93.7 per cent for the schools in urban areas.<sup>47</sup> Across regions, children in the Southern region of the country had their schools open on 92.9 per cent of the visits, higher than for the children in the Northern and Central regions, where schools were open on 84 per cent of the visits.

Overall, the more a school is open, the lower the dropout rate is (see Figure 17). The data indicates that the dropout rate falls from 14.8 per cent for children in schools that were open for less than 85 per cent of the

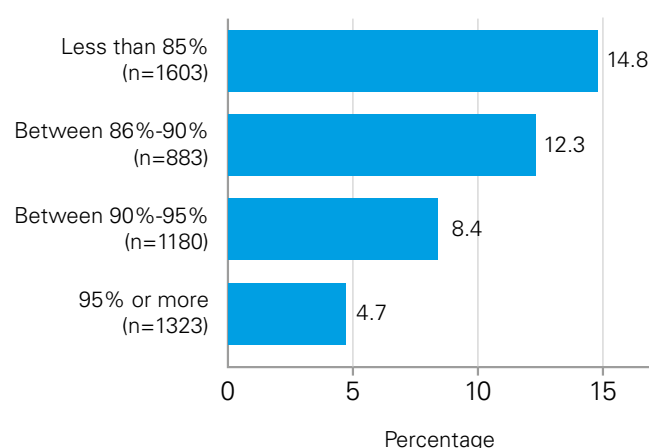
45 Differences are not significant, as t-statistics are -0.61 and 1.24, and respective p-values of 0.542 and 0.217.

46 The difference is statistically significant at the 5 per cent level (t-statistic of -2.08 and a p-value of 0.037).

47 The difference is significant at a 1 per cent level (t-statistic is equal to -14.93 and a p-value of 0).

visits, to 4.7 per cent for the children in schools that remain open for more than 95 per cent of enumerator visits.<sup>48</sup> This finding highlights two different elements. First, it is important to rely on more transparent and accountable means of verifying attendance and open days to increase learning and reduce dropout rates. Second, it shows that the length of time during schools are open matters, as this is a proxy for learning time and also for keeping children engaged and motivated with school activities.

Figure 17: Dropout rates, by percentage of observed days on which schools are open



Source: ALDE, 2019.

## 5.5. Dropout rates and student–teacher ratios

Smaller classes can benefit students because they receive individual attention from teachers that can improve their learning. More time spent in smaller classes can have cumulative effects, with students learning more in later grades (Ajani and Akinyele, 2014). However, teachers in Mozambique face large class sizes, with the latest official figures in primary education showing that the student–teacher ratio increased from 51.6 students per teacher in 2016 to 64.2 students per teacher in 2018 (Ministério da Educação e Desenvolvimento Humano, 2020). These figures differ drastically from data presented in the Service Delivery Indicators study (Bassi et al., 2019), which found ratios of 21 students per teacher in 2014 and 23.1 students per teacher in 2018.<sup>49</sup>

ALDE 2019 shows the highest student–teacher ratio to date, with an average class size of 72.3 students per teacher, up from 62.6 students per teacher in 2018. Ratios are highest in the Northern region (80), decreased in the Central region (60.7) and are lowest in the Southern region (54.6). Student–teacher ratios did not vary significantly between rural and urban areas. Smaller student–teacher ratios are associated with reduced dropout rates. Up to a ratio of 60, the associated dropout rate stays around 11.2 per cent, but it increases and reaches a value of 17.6 per cent for students in schools with ratios above 79 (see Figure 18).<sup>50</sup>

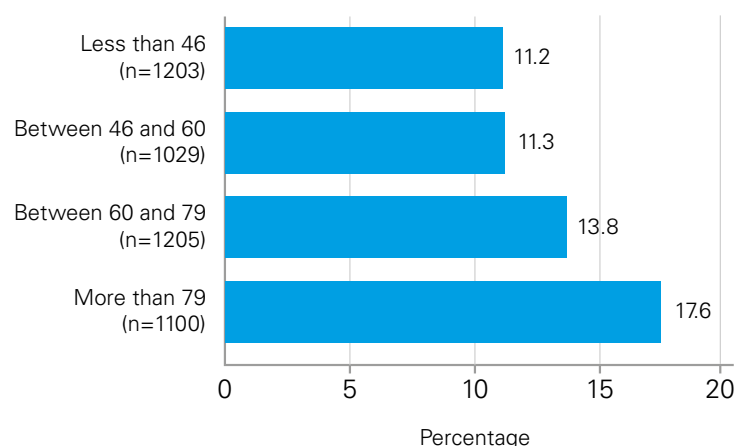
48 The differences between the levels of school-observed working days are significant. The difference between the first two levels is significant at a 10 per cent level (t-statistic of -1.67 and a p-value of 0.094). The difference between the second and third category is significant at a 1 per cent level (t-statistic of 2.87 and a p-value of 0). Finally, the difference between the third and fourth category is significant at a 1 per cent level (t-statistic=3.94 and a p-value of 0).

49 The difference might be attributable to the methodologies. Official figures come from administrative records for all schools in the country. Figures from the Service Delivery Indicators are based on a sample of schools. Despite the large difference in point estimates, both sources confirmed that student–teacher ratios have deteriorated over the years.

50 There is not a significant difference between the first two levels (a ratio below 46 and a ratio between 46 and 60). The significant differences appear when the ratio reaches the ratios between 60 and 79 (with a t-statistic of 2.79 and a p-value of 0.005) and when it reaches the ratios higher than 79 (with a t-statistic of 3.46 and a p-value of 0.001).



Figure 18: Dropout rates, by student–teacher ratio



Source: ALDE, 2019.

This association between dropout rate and the student–teacher ratio alone may indicate that reducing class size would be a good strategy to improve student retention. However, decision-makers must exercise caution when considering the policy implications of reducing student–teacher ratios. It could be that smaller classes are achieved, but that as a result, teachers are assigned to teach several smaller classes and the possible benefits are diluted due to increased teacher workload (Koc and Celik, 2015).

## 5.6. Dropout rates and access to school infrastructure

The role of infrastructure on educational attainment is far reaching. Schools that are soundly built, provide basic services, have good indoor environmental quality and offer outside space to play have positive impacts on attendance for students, teachers and school directors alike and can improve students' health and teachers' motivation (Barrett et al., 2019).

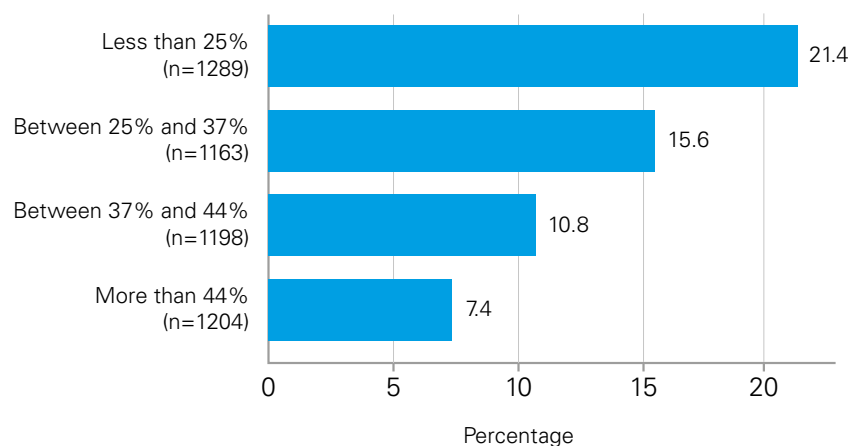
The average score on an index of access to school infrastructure is 35 per cent (see Annex 1). Children in the Southern region scored better in terms of access to school infrastructure (44.5 per cent) than their counterparts in the Northern (32.9 per cent) and Central (31.1 per cent) regions. Additionally, the divide between the urban and the rural areas is considerable: the average index for children in rural areas is 30.1 per cent, in stark contrast to an average of 52.9 per cent in urban areas.<sup>51</sup>

Higher scores in the index of access to school infrastructure are associated with significantly lower dropout rates (see Figure 19).<sup>52</sup> This was further confirmed by a hierarchical logistic model that found that students scoring 37 per cent or more in the index have a reduction in the probability of dropout of between 5.7 and 7.1 per cent (see Annex 1). These results should be read with caution, however, as school infrastructure is expected to be better in communities with higher levels of economic development.

<sup>51</sup> This difference is significant at a 1 per cent level (t-statistic is equal to -31.31 and a p-value of 0).

<sup>52</sup> All differences are significant at a 1 per cent level and p-values are equal to 0.

Figure 19: Dropout rates, by access level to school infrastructure



Source: ALDE, 2019.

## 5.7. Dropout rates and WASH services at school

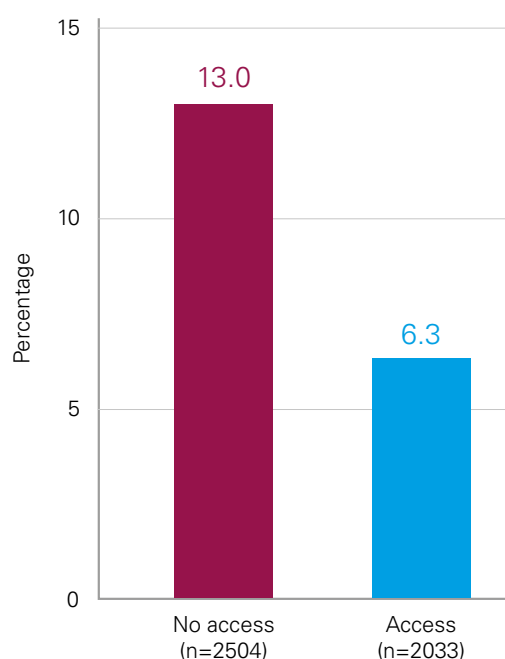
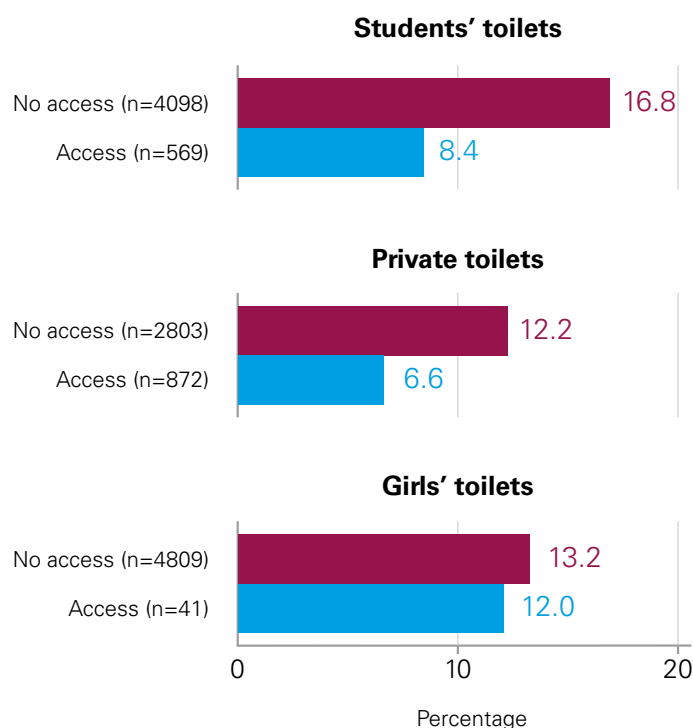
Evidence around the world confirms that WASH services in schools have positive impacts on child health by reducing diarrhoeal diseases and other hygiene-related diseases, and also improve student attendance by providing services (especially for girls) and curtailing disease transmission (McMichael, 2019). However, the reality in Mozambique is one of unequal access to WASH services at school. While children's access to drinking water at school is 85.1 per cent in the Southern region, it is only 37 per cent and 27.2 per cent in the Northern and Central regions respectively. Moreover, 99.9 per cent of children in urban areas have access to students' exclusive toilets, compared with 77.7 per cent in rural areas. Children in rural areas also have less access to private toilets at school than children in urban areas (59.9 per cent and 87.3 per cent respectively).

Access to WASH services at school is associated with reduced dropout rates (see Figure 20). Access to water is related to a reduction in dropout rates of almost 50 per cent (see Figure 20 panel a). In terms of access to sanitation, having toilets for the exclusive use of students, toilets exclusive for girls and private toilets are also associated with a reduced dropout rate (see Figure 20 panel b). Exclusive toilets for girls seem to have the weakest relationship with dropout among all the considered WASH services, yet the difference is significant.<sup>53</sup>

Although access to WASH services is very important, another element to consider is their quality. At the time of their visit, enumerators assessed the quality of the infrastructure at school. The data shows the extent of the need to improve the maintenance of the WASH infrastructure across the country. In terms of drinking water, 75.9 per cent of children studied at schools where the drinking water facilities needed repairs or were unavailable. Figures for sanitation services are even higher: 87.3 per cent of students were at schools where the flushing toilets needed repairs or were not available. The challenge for school directors and education authorities is not only to guarantee access to these services, but also to secure their quality and availability throughout the school year.

<sup>53</sup> All differences are significant at a 1 per cent level as the associated p-values are close to 0.

Figure 20: Dropout rates, by access to selected WASH services at school

**a) Water services****b) Sanitation services**

Source: ALDE, 2019.

**5.8. Dropout rates and safety at the school**

ALDE asks caregivers about the safety of their children at school. (This may introduce a bias in the measurement, because children themselves are not asked directly about their safety.) According to caregivers, 94.8 per cent of their children felt safe at school in 2019. This represents a slight reduction from the 97.3 per cent reported in 2018. Boys (94.1 per cent) feel less safe at school than girls (95.7 per cent).<sup>54</sup> As might be expected, given the dynamics of armed conflict in the country, 93.5 per cent of students in the Northern region feel safe at school, compared with 97 per cent of students in the Southern region.

No relationship was found between reported safety at school in 2019 and the dropout rate. Furthermore, ALDE data, both from 2018 and 2019, revealed that none of the different indicators of bullying (such as being threatened, hit or having belongings destroyed by others) is related to dropout. The only significant relationship is found between safety at school in 2018 and the dropout rates in 2019.<sup>55</sup> Children who did not feel safe at school during 2018 had a dropout rate in 2019 more than twice the rate of children who did feel safe (see Figure 21).

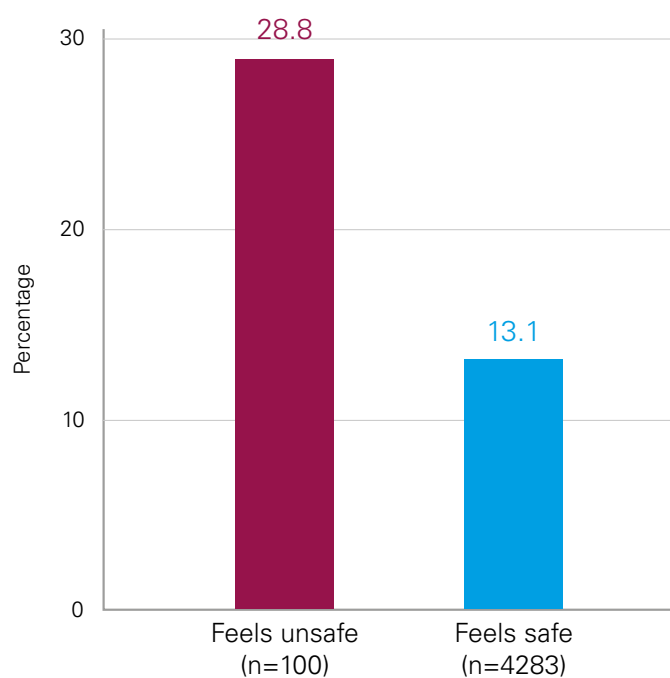
Previous studies have found that the perception of safety at school drives dropout decisions (DeLuca and Rosenbaum, 2000). However, ALDE 2019 suggests that children and their caregivers may not make immediate decisions on dropout based on their exposure to conflict or violence at school. This is an

<sup>54</sup> This difference is significant at a 5 per cent level (t-statistic is equal to 2.23 and the p-value is 0.022).

<sup>55</sup> The relationship between the reported safety at school in 2019 and the dropout is not significant as t-statistic is -1.51 and a p-value of 0.132. However, the relation is significant at a 1 per cent level when using the safety at school reported in 2018, as the t-statistic is 6.08 and the p-value is equal to 0.

important finding that means it is possible to support children on the verge of dropping out due to safety concerns. As they take time to make the decision based on safety, authorities, teachers, school directors and communities can help improve safety at school and, ultimately, school retention.

Figure 21: Dropout rates, by whether the child is said to feel safe at school



Source: ALDE, 2018-2019.



## 6. Dropout rates and community-level factors

### Key findings

- **Access to infrastructure and services is associated with differences in dropout rates.** Children living in communities with lower levels of access to infrastructure and services had higher dropout rates than children living in communities with high levels of access.
- **Children who live further away from school tend to have higher dropout rates.** While children who live 30 minutes or less from school have dropout rates around 13 per cent, children living more than 30 minutes from school experience dropout rates of 17.4 per cent.
- **Community norms and participation in traditional practices are linked to higher dropout rates, especially for girls.** Girls who participated in initiation rites had dropout rates that were 18 percentage points higher than girls who did not. For boys, participation in initiation rites is associated with a 10-percentage point increase in dropout rates.

Understanding the association of community-level factors with children's educational attainment is important for policymakers as they consider ways to align policies with the incentives, constraints and social dynamics already in place in diverse communities across Mozambique.

### 6.1. Dropout rates and access to infrastructure and services

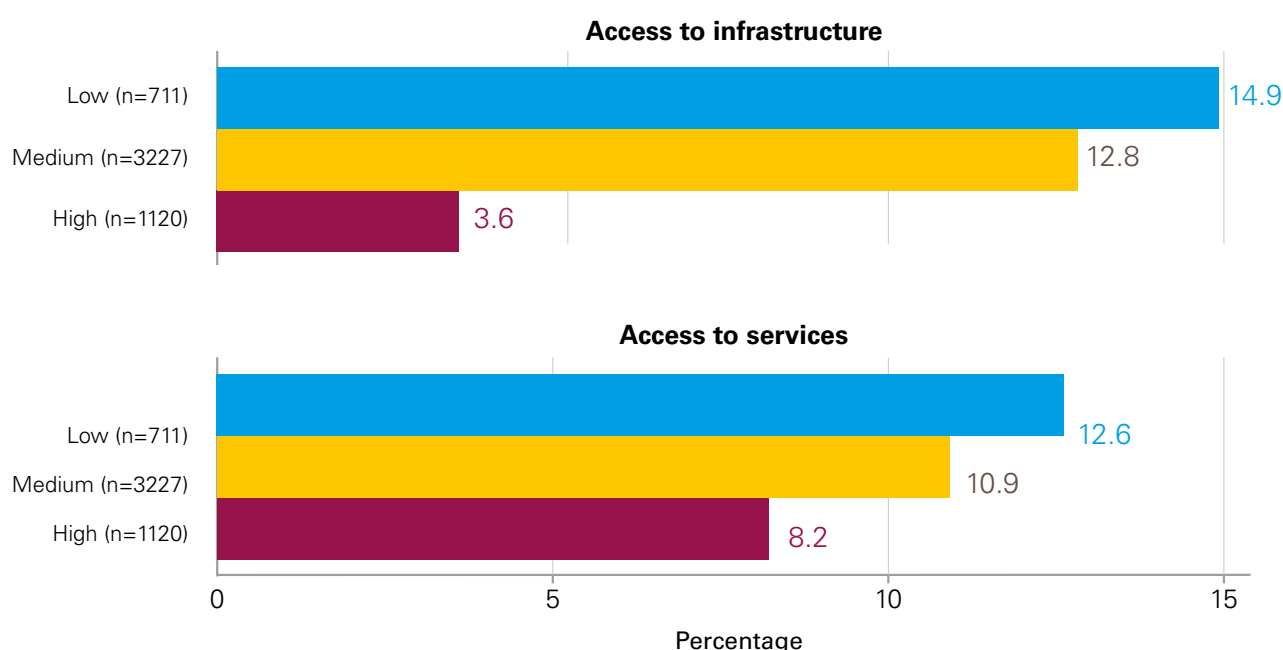
An index of access to infrastructure and services was computed and levels of access were defined based on the distribution of the scores in the index (see Annex 1). The majority of children live in communities with medium access to infrastructure (64.2 per cent of the children) and to services (45.6 per cent of the children). While medium levels of access to infrastructure largely had not changed since ALDE 2018 (63.1 per cent), there was an increase in the number of children who moved to a medium level of access to services in 2019 compared with 2018 (33.4 per cent). Differences among regions and between urban and rural areas are evident. Children living in urban areas were nearly twice as likely to have high levels of access to services compared with children in rural areas. Regional differences are also evident. Only 17.5 per cent of children in the Northern region live in communities with high access to infrastructure, compared to 41.4 per cent of children in the Southern region.

Increased community access to services and infrastructure is associated with lower dropout rates (see Figure 22).<sup>56</sup> The positive association between higher access levels and improved retention is not a coincidence. Previous evidence suggests that increased access to services and infrastructure improves the quality of health and education services, addresses gender inequalities in rural areas, promotes social inclusion and social mobility, and preserves the environment (Sapkota, 2014).

Some challenges remain: access to some school-related services is still very low across communities in the country. For instance, in a multilingual country where Portuguese is the official teaching language, only 12.7 per cent of children had access to a bilingual education. Another critical school service is the meal programme: only 7.1 per cent of children had access to a school meal programme. This figure, while higher than the one reported by the World Food Programme (3 per cent in 2019; WFP, 2020), is still low in a country where stunting can reach 50 per cent in the Northern provinces (World Bank, 2020a). Finally, only 4.7 per cent of children had access to pre-school education in their communities.

<sup>56</sup> The difference between the medium- and high access level to infrastructure is significant at a 1 per cent level (t-statistic is 11.64 and a p-value of 0.000). The difference between the medium- and high access level to services is only significant at a 5 per cent level (t-statistic is 2.54 and a p-value of 0.011).

Figure 22: Dropout rates, by community-level access to infrastructure and services



Source: ALDE, 2019.

## 6.2. Dropout rates and the distance to school

Long-distance travel to school is related to absenteeism, delinquency, truancy, lateness and indiscipline, which can contribute to fatigue, reduced interest in education and ultimately, dropout (Ebinum et al., 2017). Longer travel time to school poses increased danger of physical or sexual assault, especially for girls (Roby et al., 2009), prevents children from reconciling work and school attendance (Vuri, 2008) and can increase direct costs to families, including for transport (Owoeye and Yara, 2011).

On the time taken to travel to school, 41.2 per cent of the children spend under 15 minutes, 30.8 per cent spend between 15 and 30 minutes and 27.9 per cent spend more than 30 minutes. More children in rural areas (41.3 per cent) live under 15 minutes from school than children in urban areas (35.9 per cent).<sup>57</sup> As for the regional differences, more children in the Northern region live closer to school (45.5 per cent) than children in the Southern region (32.7 per cent).<sup>58</sup> Overall, more children in the Southern region have to spend 30 minutes or more going to school than the children in the other regions.

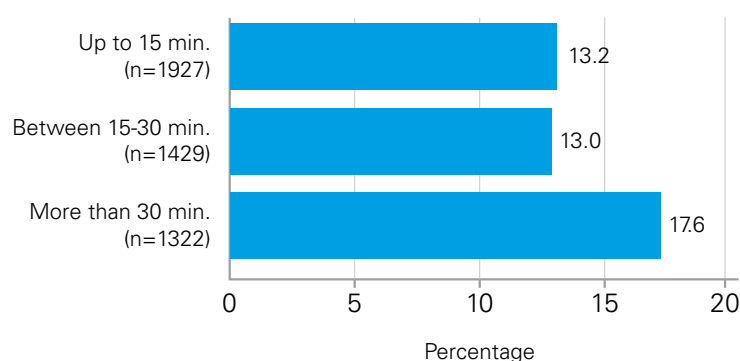
ALDE 2019 suggests that there is not a linear relationship between dropout rates and the distance travelled to school. Dropout rates for children spending up to 15 minutes getting to school are not significantly different than those for children spending between 15 and 30 minutes travelling. Yet, dropout rates are significantly different and higher when children spend more than 30 minutes on travel to school (see Figure 23).<sup>59</sup> On top of the distance to school, safety on the way to school also matters. Results from a hierarchical logistic model indicate that a safe commute to school reduced the probability of dropout by 4 per cent, almost twice the reduction seen in living closer to school (see Annex 1).

<sup>57</sup> The difference is significant at a 5 per cent level, with a t-statistic of 2.38 and a p-value of 0.017.

<sup>58</sup> The t-statistic of -7.21 and a p-value of 0 confirm a difference that is statistically significant at a 1 per cent level.

<sup>59</sup> This difference is significant at a 1 per cent level, with a t-statistic of -3.27 and a p-value of 0.001.

Figure 23: Dropout rates, by time spent travelling to school



Source: ALDE, 2019.

### 6.3. Dropout rates and participation in initiation rites

It is beyond the scope of this report to explain the role of initiation rites for Mozambican ethnic groups and how they perform or conduct these rites.<sup>60</sup> In general, there was a small increase in participation in these rites from 2018 (18.6 per cent) to 2019 (20.4 per cent). In ALDE 2019, 29.1 per cent of boys and 10.5 per cent of girls have participated in initiation rites.<sup>61</sup> Differences across the regions are important. While participation in these rites was 34.1 per cent for children in the Northern region, the figures are lower for the children in the Central (3.5 per cent) and Southern (4.3 per cent) regions. As could be expected, given the structure and meaning of these rites, participation is higher in the oldest age group: it reaches 42 per cent in the 13-year-or older age group, compared with only 11.3 per cent in the 11–12-year age group).

Participation in initiation rites is associated with higher dropout rates for both boys and girls (see Figure 24).<sup>62</sup> A confirmation of this finding comes from the results of a hierarchical logistical model that indicates that, on average, participation in initiation rites is related to increases in the probability of dropout by around 4 per cent (see Annex 1). Although more boys than girls have taken part in those rituals, the dropout rate for the girls that participated in those rites is higher than for the boys. For girls, participation may imply loss of time in school during rituals, as well as engagement in sexual activities, changes in behaviour and early marriage after the rituals (Rehema et al., 2014). School councils and local authorities play an important role in advocating for these rites to be performed during school holidays and for those rites not to interfere with academic activities.

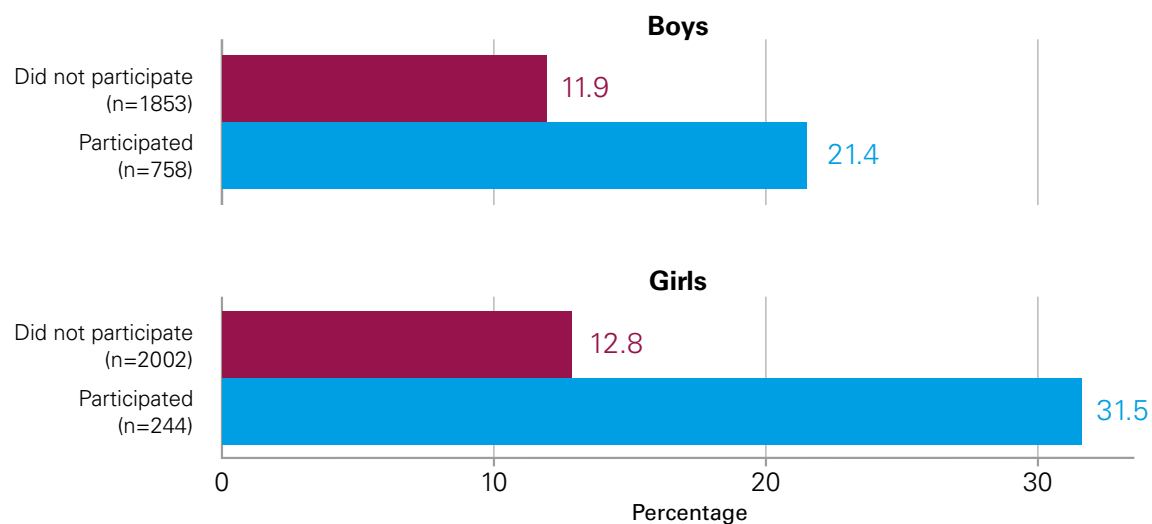
<sup>60</sup> See for instance: Os ritos de iniciação no contexto actual (Osório and Macuácuá, 2003).

<sup>61</sup> With a t-statistic of -16.89 and a p-value of 0, this difference is significant at a 1 per cent level.

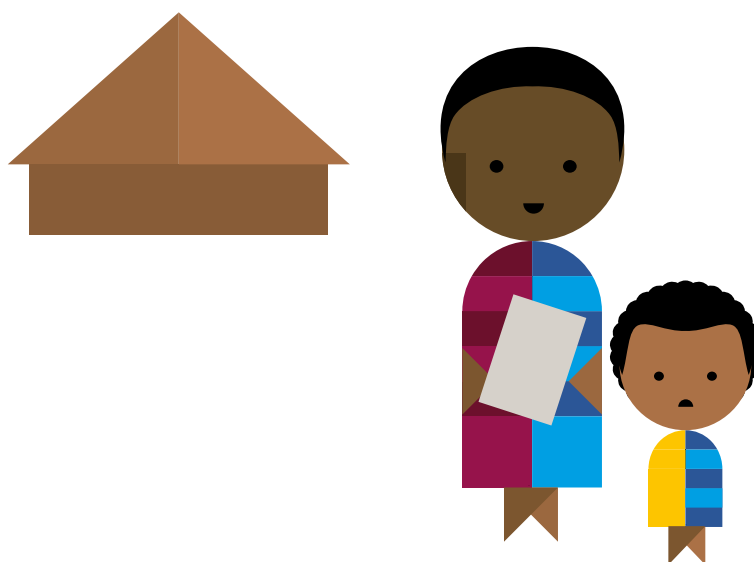
<sup>62</sup> The difference is significant at a 1 per cent level for the boys (t-statistic is 5.71 and a p-value of 0) and for the girls (t-statistic is 6.09 and a p-value of 0).



Figure 24: Dropout rates, by gender and participation in initiation rites



Source: ALDE, 2019.



## 7. Dropout rates and learning outcomes

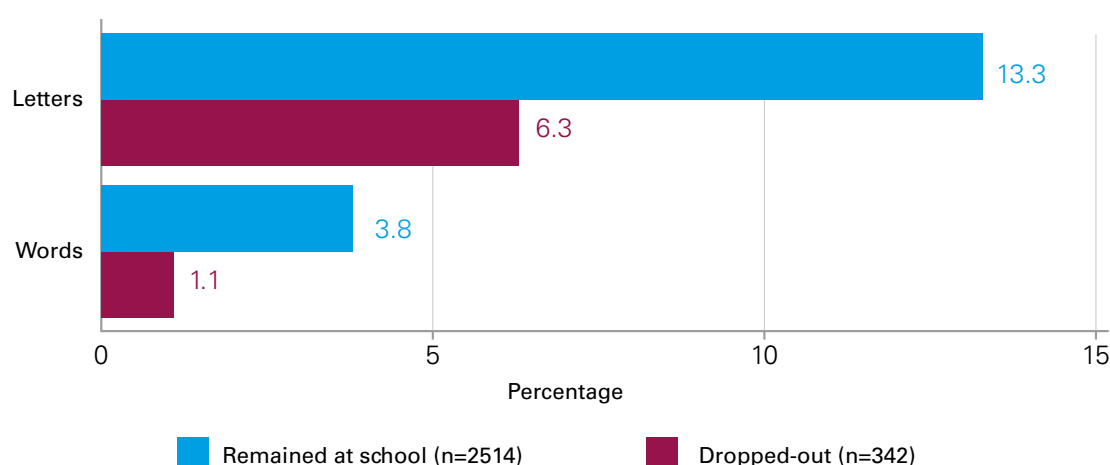
### Key findings

- **Children who drop out struggle to learn and remain in school as they have lower levels of foundational literacy skills.** Children that dropped out had lower scores on literacy tasks than their peers who had remained enrolled in school. Enrolled children could correctly identify nearly twice as many letters and 3.5 times as many words than children who had dropped out.

The relationship between learning and dropout is complex (see for instance Lloyd et al., 2000): low learning attainment can lead to dropout, but dropout can also result in students' learning levels remaining stagnant, limiting their human capital accumulation and labour market performance. The Early Grade Reading Assessment (EGRA) was designed to evaluate the foundational skills for literacy acquisition in early primary grades (Gove and Wetterberg, 2011). EGRA includes both timed and untimed tasks, and is usually administered to students in primary grades 1–3 (see Annex 1). However, the assessment has also been applied to students in grade 4 due to the poor reading skills reported in previous primary education assessments in Mozambique (Chimbutane et al., 2019).

Children who remained enrolled in school consistently performed better on EGRA tasks compared with children who dropped out.<sup>63</sup> Enrolled children could correctly identify nearly twice as many letters and 3.5 times as many familiar words as children who had dropped out (see Figure 25).<sup>64</sup>

Figure 25: EGRA familiar word reading and letter identification scores, by dropout status



Source: ALDE, 2019.

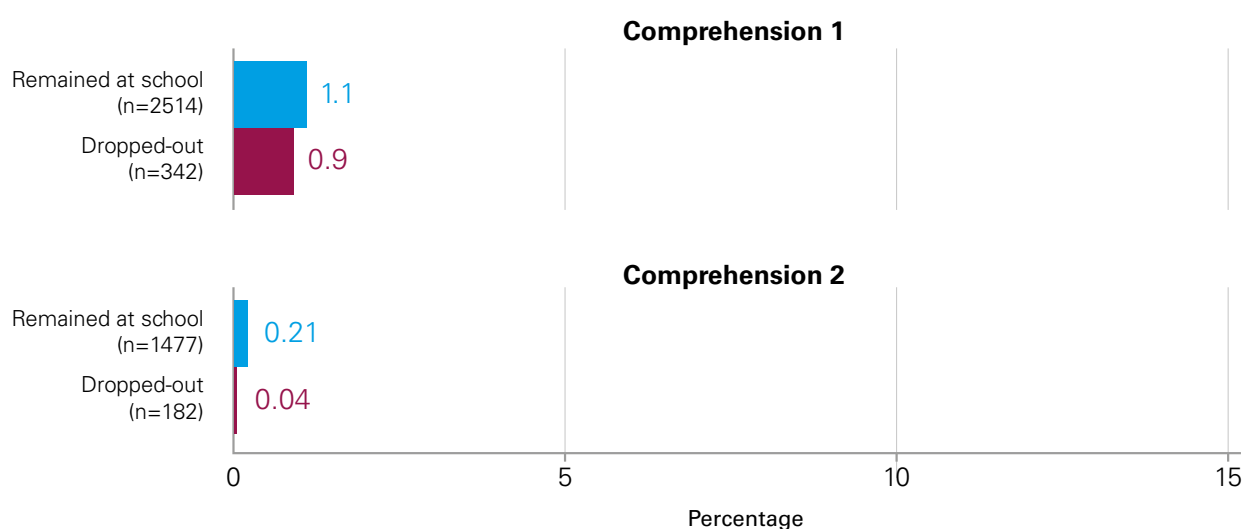
Without mastering the basic literacy skills such as identifying letters and words, students become less likely to achieve reading comprehension. On average, children could only correctly answer one listening

<sup>63</sup> ALDE conducted EGRA once the children and their households could be located and surveyed. At that point, those who had abandoned school had already dropped out and EGRA can be considered an ex-post measure.

<sup>64</sup> These differences are highly significant. For letter identification, the t-statistic is -8.04 and the p-value is 0. For word identification, the t-statistic is -8.45 and the p-value is 0.

comprehension question out of the four provided (see Figure 26 comprehension 1). Children who remained in school scored marginally higher than those who had dropped out.<sup>65</sup> The sample size was further reduced for the second comprehension assessment,<sup>66</sup> a reading comprehension (with five questions) and the scores are even lower (see Figure 26 comprehension 2).<sup>67</sup> Scores are so low for this second reading comprehension test, with the dropout children scoring virtually 0, that no salient difference in terms of location, gender or age can be reported.

Figure 26: EGRA comprehension scores, by dropout status



Source: ALDE, 2019.

When comparing results for only the children who dropped out, there is variation in learning outcomes related to location and gender. Children living in rural areas who dropped out had lower scores in letter identification and familiar word reading than urban children who had dropped out. Regionally, children who had dropped out in the Southern region had the lowest scores. On average, children who had dropped out in the Southern region could only correctly identify 0.9 letters and read 0.3 words, while those in the Central region could identify 9.7 letters and read 2.1 words. Finally, there is also a large gender difference. Dropout boys could correctly identify 7.9 letters and read 1.4 words, while dropout girls could only identify 4.5 letters and read 0.7 words.

Early reading intervention programmes can be an effective strategy to address this learning poverty crisis in Mozambique. The evidence suggests that these interventions have reduced dropout rates among children with learning disabilities (Vaughn et al., 2015) and improved academic performance in mathematics and other subjects (Korhonen et al, 2014). More of this will be explored in the next wave of ALDE as it will be possible to have a more robust estimation of the learning differentials and, above all, the dynamic relationship between literacy skills and educational outcomes (such as attendance, attainment and retention).

<sup>65</sup> The difference is significant at a 5 per cent level (t-statistic of -2.5 and a p-value of 0.013).

<sup>66</sup> There are conditions that children should meet in reading fluency to move to the comprehension task. If the child reads fewer than 15 words (line 15) in one minute in the reading fluency task, no comprehension question is asked. Where the child could pass that threshold, the number of questions depended on the number of text lines read. Owing to sample reductions, the results on the reading fluency test are not analyzed here.

<sup>67</sup> Enrolled children scored higher on reading comprehension 2, as the difference for comprehension 2 is highly significant (t-statistic of -5.87 with a p-value of 0).

## 8. Conclusions and policy recommendations

This report has presented an analysis of the main determinants of primary school dropout in Mozambique. Informed by the socio-ecological theory of human development (Bronfenbrenner, 1979), the findings highlight how factors at the individual, household, school and community level are interrelated in the process of dropout from school at all grades. With individual-level and system-wide interventions, it is possible to support children most at risk of dropping out by taking mitigating measures to strengthen school attendance, retention and so learning achievement among these children.

Results from ALDE 2019 can be used as the basis for designing effective policies to reduce dropouts and improve the educational outcomes for all children in Mozambique. These policy recommendations are proposed to inform the ongoing dialogue between the Ministry of Education and Human Development, the local authorities, international development partners, teachers, parents and caregivers, students and communities to advance the country's Education Sector Plan (ESP).

ALDE 2019 proposes two groups of recommendations. The first group comprises those recommendations that can be easily implemented in the short term due to the presence of existing policy tools and mechanisms within the education system:

**Harmonize a transparent, accountable and effective early warning system to monitor absenteeism and school closures.** When children start missing school frequently, schools need to readily have the necessary information to contact the caregivers. The ALDE 2018 report proposed that such a system needs to be based on effective communication between schools and parents or caregivers. The same system can be used to help monitor the attendance of teachers and directors, as well as school closures. An early warning system needs to be transparent in the definition of the criteria for interventions or remedial actions. It also needs to be accountable, as due intervention procedures have to be in place. Finally, the system should work for school directors and other educational authorities as a whole, being fully integrated into the EMIS (where possible) and not become an untenable administrative burden. Such a system can be built on the existing Community Score Card (CSC) programme.

This initiative can be further strengthened by training school councils and communities within the same Pedagogical Zone on how to fill in the CSC and how to use it to report to the Education, Youth and Technology District Services, the Regional Directorates of Education and MINEDH. A future wave of ALDE can be the opportunity to evaluate the programme (in 90 schools of the ALDE sample) by providing evidence to strengthen the national roll-out of monitoring processes.

**Enhance and strengthen the capabilities of school councils to mobilize and engage communities.** More active and representative school councils can lead community-based and community-wide actions. There are four possible areas where actionable steps can be taken. The first is to use a share of their budgets and to mobilize the communities to build and maintain school infrastructure, especially WASH infrastructure. The second is to garner a strong community mobilization to help reduce the obstacles that prevent children staying in school while participating in initiation rites. Third, school councils can support the continuous activities of Girls' Clubs and interest-specific students' clubs (Círculos de Interesse in Portuguese) as a way to promote participation and involvement in extra-curricular activities. The fourth, finally, is related to the role of community members in providing safety to children on their way to and from school and while in school. Taking advantage of the increasing availability of smart mobile devices, community members can help schools report safety issues and warn students and caregivers about possible threats related to violence or natural disasters. Enhanced mobilization capabilities of school councils are already foreseen as part of the overarching strategy of revitalizing school councils currently being implemented by MINEDH.

These enhanced capabilities can be achieved by providing more training for school council members and expanding the distribution of the school council manual and the support kit. Education administrators also require training on the use of the guidelines for monitoring and fostering co-operation among school councils within the same Regional Education Directorate and the same Pedagogical Zone.

**Train and hire more female school directors.** Female directors can be one of the key interventions to reduce the dropout rate according to the finding from this study. Schools led by women tended to have lower dropout rates than schools led by men. Therefore, it is recommendable to hire more female school directors, especially in those schools with high dropout rates, in rural areas and in Central and Northern regions.

The second group of recommendations comprises policies that can be implemented in the medium term as new tools and regulations within the system may be needed as a prerequisite:

**Improve the quality of district supervision and use its findings for better school management.**

Supervision visits can act as an early performance evaluation of schools and identify management and internal control issues that need to be addressed. Supervision visits can be the opportunity to increase co-operation and co-ordination among school directors and education authorities at different levels. In this way, supervision visits can help establish support mechanisms that result in a bottom-up approach to address schools' needs and challenges. These visits can be designed as an opportunity for all stakeholders to come together, gather relevant information for decision making and prepare improvement plans that fit the local contexts. Supervision visits need to translate into actionable and feasible interventions that are monitored by the district authorities, school administrators and communities.

Simple school report cards can be developed from administrative data to quickly provide information to district officials and schools on the status and needs of their schools compared with comparable schools across the country ([Jarousse et al., 2019](#)).

**Find a smart, cost-effective and equity-based formula to allocate resources across the country.** ALDE 2018 proposed a resource allocation formula that would support schools in need in the most impoverished and remote communities. Such an allocation formula can address the deep structural regional differences and the rural–urban divide in the country. Based on the funds and resources available within the school grant (*Programa de Apoio Directo às Escolas* (ADE) in Portuguese), that formula can help mobilize the resources necessary to close the gaps in terms of school infrastructure, especially WASH-related infrastructure, across the country. Additionally, the formula can define the investments needed to improve the resilience of schools facing higher risks from natural disasters and climate change. The same formula can be used to create incentives to encourage teachers and directors, especially females, to work in the more deprived areas. This process could follow approaches carried out by UNICEF and Ministry of Education partners in other countries by using administrative data to develop an equity index for the allocation of resources ([Jarousse et al., 2019](#)).

Reallocating teaching staff across the country will help reduce student–teacher ratios. However, two elements need to be in place before designing and implementing the formula. First, it is necessary to update the information on the availability and quality of infrastructure, as well as other supporting resources (such as teaching and administrative staff) in schools across the country. Second, authorities need to develop a methodology to assess the levels of school resilience and vulnerability, in order to acknowledge needs in the light of threats posed by climate change.

**Train and hire more teachers, especially female teachers in the schools with high student-teacher ratio.** Hiring more teachers in Mozambique is a long and ongoing challenge for MINEDH, as most of the recurring cost is on salaries. However, if this problem is not addressed properly, new investments may not bring satisfactory results. Prior to this challenge of increasing the number of teachers, it is recommended, based on the evidence of this study, to hire more female teachers to increase their proportion within the total number of teachers, as this can result in lower dropout rates.

**Provide material support for vulnerable children to remain in school.** Based on well-defined criteria, this type of support can translate into improved student retention by reducing the opportunity cost of education due to deprivation and vulnerability. Material support can help address specific forms of deprivation. For instance, distributing school kits (with school-related items, such as notebooks, pens and textbooks) and expanding the coverage of the meal programme (*Programa Nacional de Alimentação Escolar* (PRONAE) in Portuguese) can guarantee that children remain in school and have the basic items to study and learn.

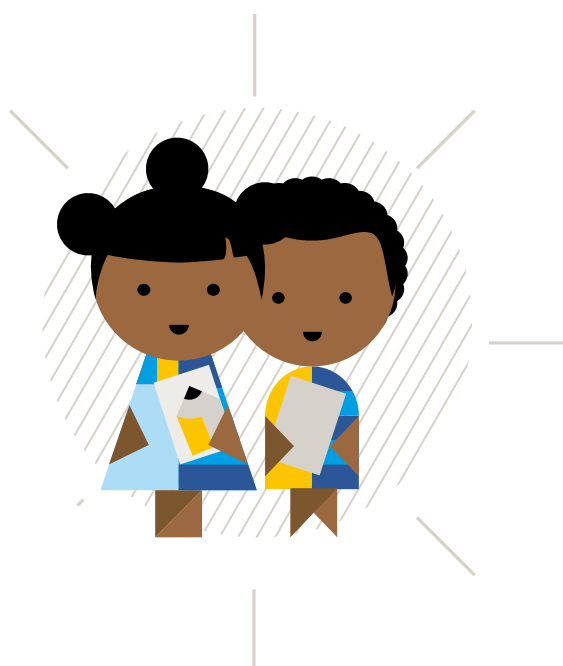
These support mechanisms should reach vulnerable children, such as children who have to work, pregnant students (or those who already have children) and also children in households affected by natural disasters or other types of shock. To face the challenges posed by natural disasters, this support can be embedded within schools' emergency plans. School councils can play a pivotal role in identifying the beneficiaries and supporting the implementation and distribution of these support mechanisms.

**Invest more to improve students' learning skills from the early grades onwards.** As learning levels are low due to deficient literacy skills, it is necessary to invest more in the national reading programme. That investment is needed to expand its coverage, but also to develop the content, methodologies and materials, tailored according to the different grades, ages and contexts of the children. Focus on the early years should include pre-primary education, given the strong association between early childhood education and outcomes throughout primary school and beyond. This should also include the necessary training to enable teachers to deliver and implement the reading programme in their classrooms effectively. For this purpose, it is important to define the role of the Pedagogical Zones in promoting the exchange of successful experiences among teachers and to support the integration of this programme into their daily teaching activities.

This programme can also be used to assess the learning needs of students and to design remedial actions. The expansion of the national reading programme can help expand access to bilingual education and to produce materials in the different languages and dialects used in the country.

## 8.1. Areas for future investigation

As ALDE continues past 2019, findings from this report open up new avenues for potential research and analysis in the future, from the development of implementation research to uncover successful, locally led innovations at school level, to unpacking the mechanisms behind the strong association between female school directors and better education outcomes. Finally, additional research and benefit incidence analysis could investigate the equity implications of spending on education, aligned with the goals for better equity in the delivery of education in Mozambique.



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# Annex 1: Methodology

## Data sampling and weighting

As mentioned in the Methodology section, a two-stage cluster sampling procedure, with a probability proportional to size (or PPS) sampling, was used. The sample is also stratified by size of school (as defined by the Ministry of Education): small, medium and large. In each stratum, 60 schools were randomly selected. The odds ratio for size is applied in each of the strata (although 74 per cent of schools are small, they represent only 38 per cent of the student population). Overall, the use of the cohort is equivalent to a simple random sample of 170 students (with a 95 per cent confidence interval and a 7.5 per cent sampling error).

Weights for the 2019 data needed to be adjusted due to attrition. The base year weights were adjusted for non-response using a propensity model approach. A logistic regression on participation in the 2019 wave was estimated using socio-economic variables (such as the number of members in the household, child's age, child's sex, urban or rural location, region of the country, among others). The predicted probability in that model was used as denominator in a ratio, having the base year weights as the numerators. That new adjusted weight was used for calculating the nationally representative statistics presented in this report.

## Data collection and cleaning

Structured questionnaires for the caregiver, head of the household, school director and teacher of the selected children were used to collect the data. The enumerators received two weeks of intensive training before the start of the actual interviews. Supervisors conducted daily checks of the data collection process and the completed questionnaires to ensure accuracy, and held weekly meetings with the enumerators. Data collection was carried during September and October 2019.

## Data analysis

The data analysis was developed at different stages. First, the distribution of the data and identification of missing values and outliers were conducted. Second, bivariate analyses were carried out to identify the potential predictors of dropout using the child-, household-, school- and community-level variables to construct the relevant figures and tables.

In the third and final stage, a multivariate analysis using econometric techniques was developed. The main goal of the econometric analysis was to find a model specification that could integrate all the relevant variables at the different levels of information (individual, household, school and communities). The starting point was the Bronfenbrenner's Socio-Ecological Model (1979). The selection of the variables took into consideration the possible biases caused by multicollinearity<sup>68</sup> and endogeneity.<sup>69</sup>

With this goal in mind, the task was to select the variables to be included in the model. This was done in an iterative process. First, the selected individual-level variables were used as independent variables in a logistic

68 Multicollinearity means that some variables in the model can be the linear combination of other variables included. For instance, consider variables related to socio-economic status. Access to water and sanitation at home are highly correlated with the wealth of the household and even its location. Including all variables correlated to wealth creates multicollinearity among the independent variables, which, in turn, impacts on the point-value of the estimates, reduces their precision and changes their significance. The same applies for other groups of variables, such as those related to the school or community factors, and that is why only some variables remain in the final specification.

69 Endogeneity is a more complex problem and may come from three different sources: omitted variable bias, simultaneity and measurement error. Perhaps the best example of omitted variables in the case of dropout is student motivation or intrahousehold resource allocation, which are known to be determinant for academic attainment. As these variables are not directly controlled for, their possible effect is wrongly attributed to the variables that are, in fact, included in the model, creating a bias and producing inconsistent estimates. A similar effect is seen when the dependent variable is also influencing the independent variables. For instance, students who repeat a grade have a higher risk of dropout. However, children who have dropped out may have a higher probability of repetition if (and when) they return to school. Measurement error can be present when variables cannot be accurately measured and have to be proxied. For instance, estimating the wealth of the family is not accurately done and it would not be possible to collect all necessary variables in the survey. The variable needs to be proxied, generating an attenuation bias that tends to push the values of the coefficients towards zero.



regression that had dropout as a dependent variable.<sup>70</sup> Then, three models were estimated, using all the variables at this level (without fixed effects, with fixed effects at the regional level and with fixed effects at the province level).<sup>71</sup> Fixed effects were chosen at the regional or province level to take into account the well-known development differences across the regions and provinces. School fixed effects were not employed as data is already clustered at the school level. At that point, the multicollinearity was assessed and variables identified as collinear were removed.<sup>72</sup> The remaining individual-level variables were, then, used in a logistic model that also included the household-level variables. The same process was repeated to include the school- and community-level variables until a parsimonious specification was found.<sup>73</sup>

Once a specification was identified, the next step consisted of recognizing that the data is grouped: children are grouped by the schools in which they were enrolled. Because of the existence of this grouping, hierarchical logistic models were preferred as they can better capture a common feature in education data: that students share a common variance due to their enrolment in their specific schools.<sup>74</sup> This grouping mechanism operates as if the students share some traits by being at the same school, but also are prone to have the same variations across all those characteristics (for more on hierarchical models, see Woltman et al., 2012).<sup>75</sup>

## Constructed variables

Both waves of ALDE, in 2018 and 2019, collected variables that were combined in an index to measure conceptual items that cannot be directly observed. The main indexes are:

- Index of family wealth: The construction of the wealth index for this analysis was based on the methodology used by the Demographic and Health Survey (DHS) (Rutstein, undated) and applied to previous waves of the DHS in Mozambique (Marchena, 2018). Most of the variables used in the DHS are also in the household questionnaire of ALDE, which makes the index comparable. After calculating the index, households are organized in quintiles according to the distribution of their wealth scores.<sup>76</sup>
- Indexes of community-level access to infrastructure and services: Community leaders were asked if they know about a set of services and infrastructure facilities in the communities where the selected children live. Scores on the community-level access to infrastructure index and community-level access to services index were classified as high, medium or low level, according to their distribution.<sup>77</sup>

70 In a logistic regression, the dependent variable is binary (a variable coded as 0 and 1). This type of estimation requires observations to be independent from each other (the dropout decision of a child does not depend on the dropout decision of another child in the sample). Furthermore, independent variables are expected not to be correlated among each other. Finally, the independent variables are expected to be linearly related to the logarithm of the odds-ratio estimated in the model. All of this is necessary to estimate the probability of an outcome (given all the independent variables).

71 In a fixed-effects model, it is recognized that data can be grouped based on observed factors and, therefore, the means of those groups are not random, but rather group-specific. In consequence, individuals within each group are comparable. For the data in ALDE 2019, that means that individuals either at the region or province level are comparable. Fixed-effects models are useful to reduce the effect of omitted variable bias due to unobserved heterogeneity when the heterogeneity is constant over time. Despite this advantage, fixed-effects estimators are highly dependent on the sample, as well as reducing the model's power by increasing the errors of the coefficients.

72 For each variable, the variance inflation factor (VIF) was calculated, which measures how the variance of each independent variable is modified by the interaction or correlation with the rest of the independent variables. As a rule of thumb, a variable with a VIF larger than 10 is considered highly correlated to the other variables in the model and can be removed.

73 A parsimonious specification is one that has great predictive power with a minimum number of independent variables.

74 While the fixed-effects regressions take into consideration the group-specific mean, the hierarchical models also take into consideration the shared variance as individuals move upward in a hierarchy of levels. Hierarchical models estimate the relationships within and between the levels of the data and are more efficient to consider the variance of the variables at the different levels.

75 For instance, a research study on grade 3 literacy in 2013 and 2016 showed ICCs of 0.42 and 0.47 at the school level respectively (MINEDH, 2017).

76 Quintiles are not all equal to 20 per cent as there are cases of multiple ties in the scores and, therefore, a best approximation is performed to balance the distribution in five different groups.

77 In each index, the selected variables were coded as dummies (1 indicating access and 0 no access). Then, the values for all variables were added and divided by possible maximum value (8 for infrastructure and 17 for services) to get the access score. Finally, the levels of access were determined by the distribution of the scores. The index of community access to infrastructure includes radio, TV, internet, library, electricity and water grid access at the community level. The index of community access to services includes public primary school, public secondary school, youth and sport services, pharmacy, health-care facility, marketplace, postal services, bank, police station, public transportation, automatic teller machine (ATM; i.e., a public cash machine), court of justice, religious facilities, single-service desk and civil registry services.

- Index of access to school infrastructure: This index is constructed following the methodology employed for the PISA analysis (OECD, 2017), using a two-parameter Item Response Theory Model that is further rescaled to a 0–100 per cent scale for easier analysis and interpretation.<sup>78</sup>

## EGRA scores

EGRA produces different scores for each task that is administered in the assessment. For letter name identification and reading, the score is the total number of letters that students could correctly read in a minute (out of 100 letters written in a card). The score on the familiar word reading is defined by the number of words students correctly read in a minute (out of 50 words presented on a card). For the comprehension assessments, four questions were asked on the listening comprehension of a short story. Additionally, five questions were asked on the reading comprehension of another short story. The number of correctly answered questions defined the respondent's respective listening and reading comprehension scores. It goes beyond the scope of these pages to present the general results of EGRA in Mozambique. Here, the scores of the children that remained enrolled are compared with the scores of children who had dropped out of school.

EGRA was administered to 2,916 students (54.1 per cent of the ALDE sample). In terms of sample composition, the EGRA subsample exhibits a slight increase in the number of rural students (90.6 per cent) when compared with the total sample (87.8 per cent). However, the gender composition remained nearly the same. The EGRA subsample also exhibits a relatively smaller dropout rate (12 per cent compared with 14.7 per cent for the whole sample). The sampling procedure guaranteed that around 46 per cent of the total number of children who had dropped out of school remained in the subsample that took the EGRA.

## Econometric results

The estimates to be presented here cannot be read as causal estimates. ALDE data does not evaluate any specific intervention across the country to prevent dropout. Furthermore, there has not been a random assignment of such interventions across the students and their schools to properly estimate the causal effect of any variable of interest. In that sense, results have to be read as the association or relationship between the dropout rate and each independent variable after controlling for all the other relevant variables considered in the socio-ecological model and that passed the specification tests. Overall, results using the 2019 data confirmed the relevance of variables already identified in the data of 2018, such as distance to school, access to school infrastructure and supervision visits.

The results of the estimated equation<sup>79</sup> report the marginal effects of the independent variables on the probability of dropout (see Table A 1). Column 1 reports the results only using the individual-level fixed effects. Column 2 reports the coefficients using individual- and province-level fixed effects. Column 3, finally, reports the results using the individual- and the region- level fixed effects.

<sup>78</sup> 22 variables related to school infrastructure (ceiling, walls, floors, entrance, doors, windows, corridors, classrooms, toilet flush, bathrooms, kitchen, drinking water, electricity, plumbing, first-aid, medical room, coffee shop, sports areas, fence, ramp, fans, lighting,) are converted into 22 dummy variables (taking the value of 1 if the infrastructure item is in good conditions or needs minor repairs and the value of zero otherwise). Then, those 22 variables are used to estimate a two-parameter item response theory model. After estimating the model, the latent trait (which measures the supposed quality of infrastructure at the school) computed in the model is assigned to all the children who study or studied in each school. Then, the latent trait is re-scaled from 0 to 100 per cent to allow for an easier division of the distribution into four access levels.

<sup>79</sup> The general form of the equation estimated is:  $\text{Dropout}_{ij} = \alpha + \sum_0^T \beta_i X_{ic} + \sum_0^T \delta_i H_{ij} + \sum_0^N \gamma_n S_{ij} + \sum_0^P \eta_p C_{ij} + \varepsilon_{ij} + \mu_j$ . For every child  $i$  in school  $j$ ,  $\text{Dropout}_{ij}$  is the dependent variable that takes a value of 1 if the child dropped out and 0 if the child remained in school.  $X_{ic}$  is a matrix of the individual-level variables (such as participation in initiation rites, repetition, work status and the observed attendance mean). Household-level variables (such as female head of household and unemployed head of household) are introduced in the model in the matrix  $H_{ij}$ . The matrix of school-level variables (such as student–teacher ratio, access to infrastructure, female teacher, teacher motivation, number of school council meetings, number of supervision visits and observed teacher's attendance mean) is represented by  $S_{ij}$ . Community-level variables (such as distance to school and safe commute to school) are controlled for in  $C_{ij}$ . Importantly, in the hierarchical model, students at the first level of data and the second level of data (grouping the students) are introduced in the equation as  $\mu_j$  or the school-level random intercept. Finally,  $\varepsilon_{ij}$  is the stochastic error term. Fixed effects are introduced in the equation for age group, for rural children, for wealth quintile and, finally, for location (either at the region or province level).

Table A 1: Hierarchical estimates of the determinants of dropout in Mozambique

Independent variable	(1)	(2)	(3)
Girls	0.0127 (0.0091)	0.0124 (0.0095)	0.013 (0.0099)
Participated in initiation rites	0.0383*** (0.0125)	0.0366*** (0.0128)	0.0372*** (0.0132)
Child repeated class	0.0363*** (0.0106)	0.0364*** (0.0108)	0.0378*** (0.0111)
Obs. student's attendance above 80 per cent	-0.0703*** (0.0138)	-0.0716*** (0.0138)	-0.0747*** (0.0139)
Female head of household	-0.0047 (0.0107)	-0.0032 (0.0112)	-0.0038 (0.0117)
Child works	0.0139 (0.0105)	0.0152 (0.011)	0.0151 (0.0114)
Unemployed head of household	0.0248* (0.0129)	0.0253* (0.0134)	0.0254* (0.0138)
Safe commute to school	-0.0405*** (0.0125)	-0.0423*** (0.0129)	-0.0432*** (0.0132)
Lives up to 15 minutes' travel time to school	-0.0205** (0.01)	-0.0227** (0.0104)	-0.0238** (0.0107)
Student-teacher ratio above 60	-0.0138 (0.0214)	-0.0248 (0.0216)	-0.0347 (0.0227)
Access to infrastructure above 37 per cent	-0.0715*** (0.0262)	-0.057** (0.0254)	-0.0669*** (0.0251)
Female teacher	-0.0137 (0.012)	-0.0131 (0.0125)	-0.0117 (0.0129)



Independent variable	(1)	(2)	(3)
Teacher would change profession	0.0112* (0.0067)	0.0103 (0.0069)	0.0097 (0.0071)
Up to 3 school council meetings	0.021 (0.0215)	0.0049 (0.0229)	0.0088 (0.0229)
2–3 supervision visits	0.0506** (0.0239)	0.0603** (0.0246)	0.0584*** (0.0224)
4 or more supervision visits	0.0535** (0.0256)	0.0498** (0.0244)	0.068** (0.0291)
Obs. teacher attendance above 80 per cent	0.0168 (0.0119)	0.02 (0.0125)	0.0175 (0.0129)
Variance (school-level)	0.881	0.725	0.5432
Log likelihood	-1010.55	-1007.15	-1002
Observations	3,455	3,455	3,455
P-value Log–Likelihood ratio test	0	0	0
Intra-class correlation (ICC)	0.2112	0.1805	0.1417
Location fixed effects	No	Region	Province

Notes: \* significant at a 10 per cent level; \*\* significant at a 5 per cent level; \*\*\* significant at a 1 per cent level. All regressions include age group, rural location and wealth-quintile fixed effects. Table is reporting the marginal effects. Standard errors clustered at the school level.

Some words are necessary about the technicalities of the estimations presented. As the children's data is grouped by the schools, the implications of that grouping have to be commented upon. The p-values of the Log–Likelihood ratio test are equal to 0 in the three specifications presented, rejecting the hypothesis that the same model could have been estimated using a standard logistic regression. Therefore, it would have been a mistake to ignore the two levels (students and schools) and the grouping in the data. The other important information in Table A 1 is given by the ICC, which measures the percentage of the dropout variance that is explained by the school. In the data, that percentage falls as the region- and province-level effects are used in the equations, echoing how important location differences are in explaining educational outcomes in the country.<sup>80</sup> The last element is related to the variance of the school-level created intercepts in the equations.<sup>81</sup> As in the previous case, the variance is reduced as the location fixed effects are introduced, signalling that schools tend to be more similar to each other when located in the closest geographical proximity.

<sup>80</sup> In all cases, the ICCs are significantly different from zero.

<sup>81</sup> Those intercepts are created to take into account the grouping of the students' data into the schools.

## Annex 2: Figures and tables

Table A 2: Main reason for dropout

Reason	Percentage
Did not want to go to school	42.20%
Moved/migrated	11.10%
Travel	9.30%
Marriage	7.90%
No economic resources	5.80%
Sickness	5.50%
Help at home	3.50%
Work	3.40%
Distance to school	2.70%
Pregnancy	2.30%
No place at school	1.20%
Hunger	0.60%
Insecurity at school	0.60%
Calamities	0.50%
Completed primary education	0.30%
Disabilities	0.30%
Conflict	0.20%
Illness in the family	0.20%
Initiation rites	0.20%
No family permission	0.20%
Other	2.20%
<b>Total</b>	<b>100.00%</b>

Source: ALDE, 2019.

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